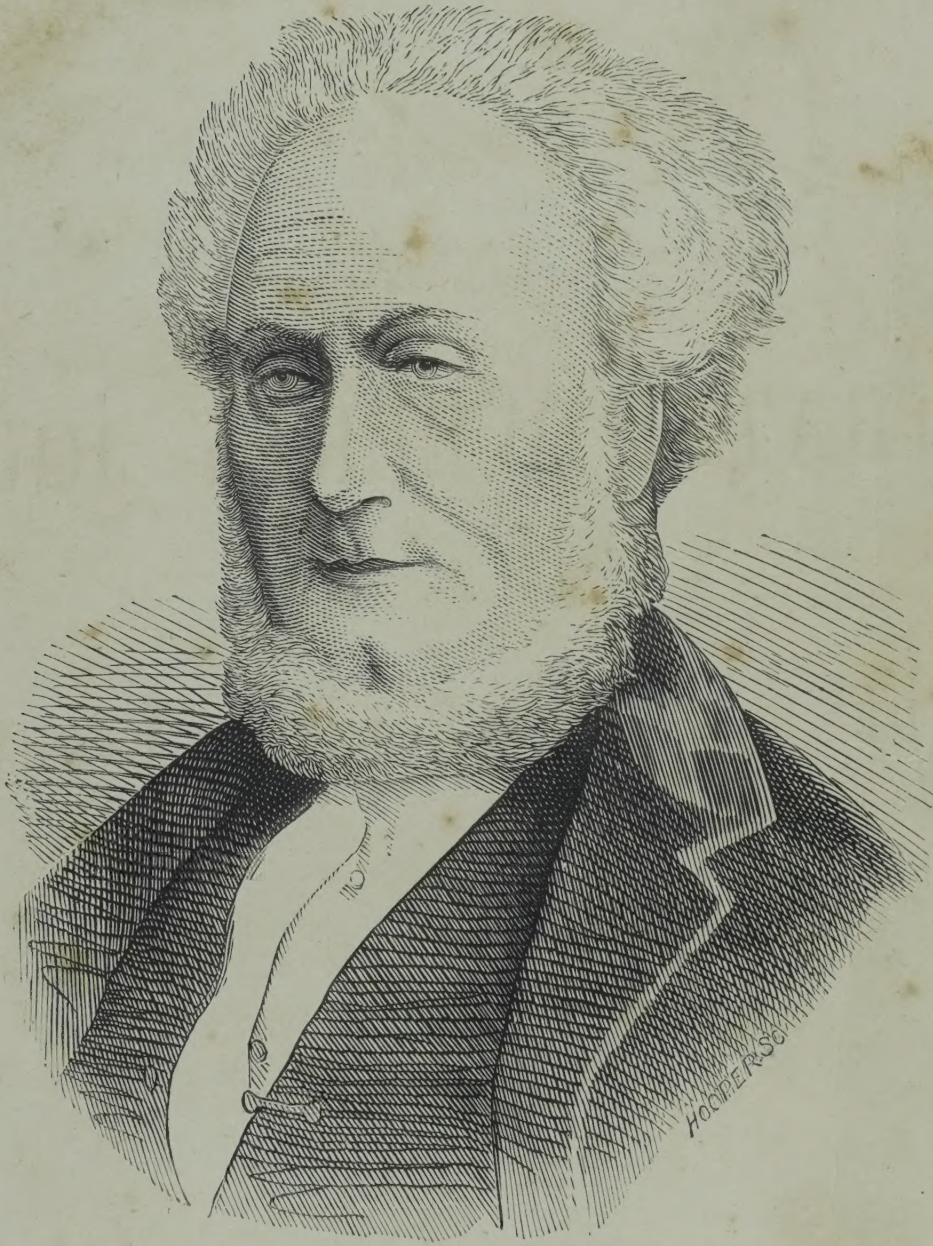


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AN

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OF

GARDENING IN ALL ITS BRANCHES.

FOUNDED BY WILLIAM ROBINSON, AUTHOR OF "ALPINE FLOWERS," &C.

THIS IS AN ART
WHICH DOES MEND NATURE: CHANGE IT RATHER: BUT
THE ART ITSELF IS NATURE.—Shakespeare.

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MR. NINIAN NIVEN.

As the last volume of THE GARDEN was prefaced by the portrait of the most distinguished landscape gardener in England, so the present is accompanied by that of MR. NIVEN, who has long been known as the leading practitioner in the same art in Ireland.

MR. NIVEN was born in the year 1799. He was the son of a gardener who, in his generation, was well known by those belonging to the old school of Scotch horticulturists, of whom, though many came south of the Tweed in keeping with a weakness inherent in Scotchmen—some still remained behind, and not a few of the present race of gardeners will, as they look back through the vista of years, still retain pleasing recollections of their early days spent under MR. NIVEN, at Keir House. His birth place was Kelvin Grove, in the neighbourhood of Glasgow; or, to be more particular, at what now forms the noble West Park of Glasgow: there he spent his early years, and there he received his education. At the age of fourteen he appears to have developed a taste for the profession of his ancestors, and felt it incumbent upon him to follow in their footsteps.

At the gardens of Bothwell Castle, then, amongst the best in the West of Scotland, and famous for an unusually valuable collection of plants—a fame, by the way, that, after a lapse of sixty years, yet attaches to the place—MR. NIVEN was bound apprentice, at the age of fourteen, under MR. THOMAS BUTLER, the then gardener, and predecessor of the present MR. TURNBULL, whose name will always be remembered as the greatest Heath grower of the day. Here no opportunity was lost in studying the numerous botanical rarities with which he was daily brought in contact; here was laid the foundation of his botanical knowledge; and, possibly, here his young mind became imbued with that love of the picturesque and beautiful in Nature for which he has become so distinguished, and which few places were more likely to give rise to than the romantic banks of the Clyde, from Bothwell Castle to its furthest source. Having completed his apprenticeship, he returned to Glasgow, in order to study drawing and painting, in both of which arts he had made considerable self-taught progress, utilising in this manner his long winter evenings of Scotch bothie life. Further, his knowledge of plants and his love for the science of botany, gained for him the friendship of the late MR. STEWART MURRAY, of the Glasgow Botanic Garden, and also of the late SIR W. HOOKER, and, under the able tuition of both of these gentlemen, he made rapid progress. A recall to Bothwell Castle, to take charge of the flower garden, interfered with the course then selected, and for which his studies were preparatory, namely, a botanical collector's life. Doubtless, with the sad fate of his old friend and associate, poor DOUGLAS, in his mind, he has long since reconciled himself to the change that then took place in his destinies.

In the year 1822 he went as gardener to Belladrum House, in Inverness-shire, where he had, as a neighbour, the late MR. DONALD BEATON, who, in a reminiscence of his early Scottish life, published years ago in the "Cottage Gardener," bore ample testimony to the energy and ability displayed by the young Glasgow gardener who had come to the far north. Those were days when a journey to the North of Scotland was almost as protracted as a journey at the present time is to America. He had scarcely been two years in his first situation as gardener before he was requested, by the then EARL OF GLENELG—who, if we mistake not, was then Chief Secretary for Ireland—to take charge of the gardens at his official residence in the Phoenix Park, Dublin. These, with ample scope and means, he remodelled. Introducing a new and methodic

system in all departments, he soon made them worthy of the brief but expressive criticism of the late Mr. LOUDON, when making a professional tour in Ireland, as recorded in his "Gardening Encyclopædia," that "it was the best managed garden in Ireland." MR. NIVEN's residence here extends over some nine or ten years, during which period he carried off a vast number of prizes at the horticultural shows. About this time the Curatorship of the Royal Dublin Society's Gardens became vacant, and he was then asked to compete for this, the premier post of his profession in Ireland, and was successful in the competition. For five years he discharged the duties that here devolved upon him so entirely to the satisfaction of the Council, that when, in 1839, he resigned his post, he received, at the hands of the Royal Dublin Society, a very handsome presentation. During the above period the grounds had been thoroughly remodelled, and great and important improvements made—improvements which have been since further modernised, and, which under the skilful management of his successor, the present DR. MOORE, render the Glasnevin Gardens a credit alike to the profession and to the country.

During the latter part of MR. NIVEN's curatorship his time was occupied to a considerable extent in carrying on professional work, and, after resigning his post, he devoted his energies entirely to the career of a landscape gardener, and has since been employed in that capacity in all parts of the country; and it would be easy to point out numerous instances where his art has assisted Nature in a manner only possible to one who was a born landscape gardener. During the thirty-four years of his life devoted to this delightful employment, he has further organised horticultural and experimental nursery grounds at the Garden Farm, Drumcondra, not far from Dublin, where, besides an admirably managed nursery, containing the finest collection of fruit trees in Ireland, are to be found a choice assortment of botanical specimens, and alpine and herbaceous borders containing mementos of the olden time, when the countless scarlet and zonal Geraniums, the Verbenas, Lobelias, and other florid elements of the modern system of flower gardening, had not as yet seen the light.

Amid the many claims on his time in connection with his professional career, as well as the entire management of his home nurseries and experimental garden, he was a not unfrequent contributor, on botanical subjects, to the periodical literature of the day, more especially in early life, and we find his name constantly occurring in "Loudon's Magazine." A valuable essay on the cultivation of the Potato, written many years ago, carried off the gold medal offered by the Royal Dublin Society; this was succeeded by a second pamphlet on the Potato disease, and, just before the close of MR. NIVEN's residence at Glasnevin, he published a popular guide to those gardens, the first, we believe, that had been attempted of any botanical garden. With the "Guide" proper was incorporated a text-book on practical botany, the object being to popularise a science that, at the period we speak of, had but few votaries among the general public. To these may be added one of the best practical treatises on the cultivation of Asparagus, the value of which is fully appreciated even at the present day.

Those who have had, as we have, the pleasure of a long acquaintance with MR. NIVEN, will bear witness to his professional and intellectual attainments, and to the courtesy with which he invariably met all who paid him a visit at his Garden Farm at Drumcondra. At the present time, at the age of seventy-five, his faculties retain their youthful vigour not only unimpaired, but matured by the experience of a professional career far longer than that allowed to most men. We trust that this experience may extend over a still longer period, and that he may continue to enjoy for some years yet the position to which his energy and ability have raised him; a wish in which we are sure his numerous friends, both in and out of his profession, will heartily unite.



THE GARDEN.

VOL. VII.

TRANSPLANTING HOLLIES.

By JAMES M'NAB, Royal Botanic Gardens, Edinburgh.

As I have often been consulted in regard to planting and transplanting Holly hedges, I will give the result of my experience on these subjects as briefly as possible. There is, perhaps, no species of hardy evergreen now in cultivation better adapted for forming hedges than the common green Holly. It is beautiful at all seasons, bears cutting-in without injury, and makes a most impenetrable and a very ornamental fence. A feeling, however, prevails against its general use in consequence of its having the reputation of being a plant of comparatively slow growth. If properly attended to, however, after planting, it will soon make a good and serviceable hedge. Some Holly hedges are now known to be in good condition, although planted upwards of a century ago; and, notwithstanding that the points of the shoots are regularly clipped off, they manage to cover in time a large space of ground. This cannot be avoided, as the lateral branches continue annually to elongate, unless temporarily disfigured by close cutting-in, say once every twenty or twenty-five years. Holly and Yew make the best evergreen fences which we have in this country; and, like the Holly, the Yew bears cutting-in well; it is, however, more subject to blemishes from various causes than the Holly, and it is less easily put right when injured. When a young Holly hedge is to be formed the plants used for it should not be less than from 18 inches to 2 feet in height. It is necessary, too, that they should have been frequently transplanted previously to being used, and that, during such removals, the roots should have been occasionally cut-in, so as to induce the formation of fibres from the cut surfaces. If the ground selected for planting the hedge should be near the nursery in which the plants grew, or at such a distance from it that the young plants can be taken in a cart with as much soil as possible attached to their roots, all will go well; but, if they have to be transferred to a distance, it is absolutely necessary to have them on the property for a year or so before being used. When received direct from a nursery establishment they are apt to be more bared of soil at their roots for the purpose of close packing than is desirable for immediate hedge-making purposes; and, therefore, the importance of having them in nursery rows in the ground for some time before being made

into a hedge, and when wanted for that purpose they can be lifted with sufficient adherent balls of earth for permanent planting. By this mode of treatment it will be found that fewer plants will answer the purpose, and that the future success of the hedge will be more complete than it otherwise would be. After the ground for the reception of the young hedge has been properly trenched and prepared for the purpose, plants should be put in with well manured soil, and afterwards watered freely with diluted liquid manure, and this should be repeated several times throughout the season. This liquid manure will be found an excellent stimulant for all young Hollies, whether planted singly or in hedge lines. After being one year planted the hedge should be slightly clipped in on each side, and this practice should be continued annually for many years afterwards, so as to induce an upward growth which it will rapidly take if the ground is in good condition. This side clipping should be accomplished during the month of September, or as soon as the young shoots are found to be properly ripened. When the hedge attains the height of 5 or 6 feet it should be regularly topped, leaving, however, one strong plant at, say every 20 feet, to form a leader, and these must be reduced to 40 feet apart, as the hedge gains strength and vigour. These leaders should be knife-pruned till they become 3 or 4 feet in height. When they are strong and somewhat aged, it will be found that they will fruit abundantly, which the hedge never can be expected to do so long as clipping is resorted to. As to transplanting large Holly hedges, say from eighteen to twenty years old, such hedges may be removed with perfect safety, provided the ground is opened up on each side a full year previous to removal, and all the large roots which come in the way are cut and smoothed over, particularly at the edges, with a sharp knife, instead of being hacked off with a spade, as too frequently happens, when few or no rootlets will be formed from their rugged extremities, whereas the smooth knife-cut roots will be found to put forth numerous fine roots. The trench may afterwards be filled in with leaf mould and sand mixed with the ordinary soil thrown out, applying a good dose of water after it has been filled in, and then allowing it to stand for a year. Autumn will be found to be the best time for root-pruning, and the hedge may be removed to the place selected for it during the following autumn or the spring of the twelvemonth. When removal takes place, the hedge should

be lifted in flakes, large or small, according to the distance to which it is to be conveyed and the appliances at command. If the distance is short, it can be laid over in pieces 3 or 4 feet long on a large board or four-handed barrow, and carried to the new trench, into which they can be slid in an upright position. After planting, fill in with good soil, and water freely, cutting off any protruding pieces that cannot be easily worked into the neighbouring flakes. If a dry summer should follow the transplanting, an occasional syringing will be desirable. With older hedges, say from thirty to forty years' standing, it is necessary to cut in the branches on each side to within 8 or 9 inches of the main stem, and to head down to within 5 feet of the ground, smoothing and darkening all the incisions. A trench should then be made on each side; all large roots should be cut off and prepared, as recommended for hedges of smaller size, and afterwards the trench should be filled in with good soil. After standing for a year or so, the hedge may be removed with impunity, either in single pieces or short flakes, shortening in the intertwining branches during the operation of lifting. With good feeding and watering, such a hedge will soon break out all over, and will again make a beautiful green fence. It will be necessary, however, to have a number of young plants at hand, in order to fill up any wide gaps that may be occasioned whilst transplanting it to its new situation. It often happens that portions of very old hedges get out of shape from various causes, and are often seen covering a large space of ground. In such cases I would recommend that all the stems should be shortened to the height wanted, say 6, 7, or 8 feet, and that all the branches should be well cut in on both sides. After this, lay a good coating of old manure and soil over the surface of the ground. Trench about $2\frac{1}{2}$ feet deep along each side, and about two feet from the old stems, forking the material well in among the roots on each side while filling in, as well as over the surface of the ground left close to the stem, and afterwards covering the ground with good soil, so as to keep the finished surface on each side about 4 or 5 inches above the ordinary ground level. By this treatment, fresh vigour will be infused into the old cut stems, much ground will be reclaimed, and the hedge will soon be made to assume its proper shape again. In the case of very old hedges, this operation had better be done late in autumn, and the stems will be found to break out freely during the following spring. The Holly, although undoubtedly a hardy plant, has occasionally been injured by frost, as happened in many places during the winter of 1860-61. At that time a hedge under my care had to be cut down to the level of the snow, which then varied from 18 inches to 2 feet in depth. As the low side branches were unkilld (being then under snow), they were all cut close in on both sides with a hedge-bill, and good soil was afterwards trenched in on each side to within 10 inches of the root portion of the stem. This hedge is now 6 feet in height, and has been so for a long time, and is as neat in appearance as it was before the injury took place. Another hedge of the same age, and injured at the same time, had only the dead tops removed; afterwards it received no attention, owing to its being in an unprotected situation, and now it is in a very dilapidated condition. Although the autumn months are generally considered to be the most favourable for transplanting Holly hedges, that operation may also be carried on in spring with perfect safety. If the summer, indeed, should be at all moist, little difficulty will be found in transplanting a Holly hedge during any month in the year, provided it has been previously prepared, and the newly-made shoots in stout short lengths. If the weather should prove dry after planting, a coating of new-mown Grass, placed on the surface of the ground on each side, will greatly benefit it, by keeping the surface moist; and, besides this, an occasional syringing night and morning may also be given with advantage. Although Holly hedges are often seen in gardens and pleasure-grounds all over the country, they are but rarely seen as a fence for agricultural purposes. If thus employed, in many places they would succeed admirably, and prove both efficient and durable, besides being pleasing to the eye. For railway fences, Holly hedges would have a good effect; and, if they received the same amount of attention, they would prove quite as ornamental and useful as the Thorn for such purposes.

NOTES OF THE WEEK.

— THE exhaustive article on Daffodils, by Mr. Niven, which we publish this week, we have preferred inserting, though lengthy, in one number, notwithstanding that we are, in consequence, prevented from publishing our usual variety of matter. The importance of the beautiful Daffodil family in the embellishment of gardens of all kinds makes us feel, however, that a complete and illustrated history of the family will be appreciated by all lovers of hardy flowers. The article will be found useful for reference for many years to come. With the exception of three of the cuts purchased from Messrs. Vilmorin, of Paris, all the illustrations have been drawn by Mr. Burbidge and engraved by Mr. Hyde.

— MR. WM. PAUL's exhibition of Roses in pots, pictorial trees, Geraniums, and other plants, furnished from his nurseries at Waltham Cross, will this year be held at the Royal Botanic Society's Gardens, Regent's Park, from the 3rd to the 10th of May inclusive.

— THE Alexandra Palace Company announce that the new palace and park will be opened on the 1st of May next.

— THE Barnes Fund, we learn, must soon be closed. The sum collected is still under £200, and, as it is desirable that that amount should be obtained, we trust that such as have not yet subscribed will lose no time in giving their support to so good a cause.

— MESSRS. BACKHOUSE write to us from York to say that Fahrenheit's thermometer registered 31° of frost there on the morning of the 30th ult., in low open ground, being 1° only above zero. They state that they also hear of a similar reading on the other side of that city.

— A NEW book on Ferns, called "The Fern Paradise," by Mr. Francis George Heath, is to be published by Hodder and Stoughton. It purports to be a plea for the culture of Ferns, and will include descriptions of ferny rambles through the green lanes, the woods, and the glens of Devonshire.

— THE council of the Royal Horticultural Society have undertaken to hold five evening meetings in 1875, at which papers will be read and discussion invited on details of the science and practice of horticulture. These meetings are fixed for the following Wednesdays, at eight o'clock, p.m., viz., January 13th and 27th, February 3rd and 24th, and March 10th.

— AT a recent meeting of the Edinburgh Botanical Society, Mr. Potts of Fettesmount, exhibited a mass of roots of the common Poplar, taken from a drain pipe, which they had completely choked up for a space of 40 feet, a growth of less than five years. Mr. Greig of Glencase, instanced a case of roots of a Willow choking up a 4-inch water pipe for a considerable distance within four years after the pipe had been laid.

— THERE is at present in bloom in Mr. Bockett's fine collection of Orchids (recently moved to Stamford Hill), a splendid plant of the beautiful and very rare *Lælia anceps Dawsonii*. It has on it three spikes, bearing seven lovely and delicate blossoms. It is in fine health, and is one of the most charming of all late-flowering Orchids. There is also in the same collection a wonderfully fine form of the *Lælia albida*, much superior, both in size and marking, to the ordinary kind. It is a very large specimen (on a block), some 2 feet by $2\frac{1}{2}$ feet, in vigorous health, and is bearing thirty-five flowers.

— MR. WOBST, of the Moscow Botanic Garden, has this year succeeded for the first time in raising the Sumbul plant (*Euryangium Sumbul*) from seed. He sowed the seeds in the autumn of 1873 in a dung bed, and covered them up later with snow and lights; they germinated freely in the spring. One notable characteristic is the manner of the development of the first leaves, which appear below the Cotyledons, a peculiarity not unfrequent in *Anagallis arvensis*, several species of *Euphorbia*, *Antirrhinum*, &c., and previously observed in some species of *Umbelliferae*. Mr. Wobst has found that the Sumbul invariably dies after once flowering; of all the plants that have flowered with him not one has thrown up a second flower. Two varieties of Sumbul root appear to be imported into this country for use in medicine, one known as Russian, and the other as Indian Sumbul. The former occurs in circular pieces ranging from $2\frac{1}{2}$ to 5 inches in diameter, and from $\frac{1}{2}$ to $1\frac{1}{2}$ inches thick; they are simply sections of the root cut across and dried, and have a dirty-brown appearance, and a roughish dark brown bark often covered with short bristly fibres. The substance of the root is coarsely fibrous and spongy, and it has a very powerful odour of musk, and a bitterish acrid taste. That known as Indian Sumbul is said to be imported from Bombay, and sometimes round by China, whence it has been called China Sumbul. It is somewhat closer, firmer, and of a more reddish tint than the Russian, and the odour is scarcely so powerful. It is used as a stimulant and anti-spasmodic in nervous affections, typhoid fevers, &c., and is usually given in the form of a tincture, but also as a powder.

THE GARDEN FLORA.

ALL THE DAFFODILS.

By J. C. NIVEN, Botanic Gardens, Hull.

Historical Remarks.

If there be one genus of plants that belongs to the region of poets and poetry more than another, it is the *Narcissus*. Theocritus, Ovid, and Virgil have sung in classic strains the poetic circumstances of its birth—how the enamoured youth, whose patronymic the genus perpetuates, sacrificed his mortal existence (if, by the way, mortal he may be called) on the altar of his own vanity, and attained a full meed of immortality as representative of the whole family of our charming Daffodils. The old Sicilian botanist, Dioscorides, before the Christian era had dawned, mentions several distinct forms, and records certain medicinal virtues which they possessed, some of which were doubtless due to a lively imagination. Our old herbalists, such as Parkinson, Dodonæus, and others, give rough, but very expressive, figures of the various species then known, which, associated with their quaint descriptions, are exceedingly interesting, and sometimes highly amusing. Linnæus describes nearly a dozen species, most of which still retain the names under which they were described by him—one of the many silent testimonies that our modern botanists bear to the clear discernment and sound judgment of that master-mind in our special field of science. Some fifty years ago, or less, there appears, however, to have been a sort of *Narcissal* cyclone in the floral world within our island, and, suddenly, we find the species increased by scores; for as many as 150 were enumerated and described by Haworth, in his "Monograph," published in 1831. In fact, so overwhelmed was he by the magnitude that the old genus had attained under his indefatigable—though not always judiciously discriminating—observation, that, in the same "Monograph," he immolates *Narcissus* once more, and raises from the ashes some sixteen genera, for several of which such as *Diomedes*, *Ganymedes*, *Ajax*, and *Hermione*, he harks back to the mythological regions, by way, I presume, of poetic compensation. To anyone familiar with the genus, it will be evident that Haworth considered the slightest variation in size, shape, or colour of any of the parts, sufficient to form the basis of a new species. No doubt there was much of uncertainty in his time as to what constituted a species; nor, indeed, has the lapse of half a century, with all its scientific progress, tended much to remove that doubt, and the question as to what a species is still remains unanswered, whether it be put with reference to this or any other genus. Dean Herbert, who devoted a long career to the study of the natural family to which the *Narcissi* belong, and who, from being an indefatigable hybridiser, ought to have been fully impressed with the inconstancy of characters thus acquired as available for descriptive botany, and the extreme danger of attempting to give them a specific value, modified Haworth's enumeration, in so far that he reduced the genera to six, and relegated many of the species to varieties; he might have gone further and called them very doubtful variations. Some allowance must be made in both the foregoing cases. Each cultivator was an enthusiast—each had accumulated a large collection of Daffodils—each, doubtless, was the possessor of one of those old-fashioned gardens where Nature reigned supreme, and where Art was banished to the outer world. In both, the fertilising pollen of the Daffodil was borne from blossom to blossom by insects, and thus crosses and intercrosses formed that, in course of time, led to many variations—some merely temporary, some permanent—but all were elevated to a position far above their rank or station. Then, again, when the mind of an enthusiast is bent on discovering a distinction, how prone it is to magnify differences that the eye of one less sanguine would detect as a mere variation, arising from such causes, as soil, situation, or season. Possibly the enthusiast may retaliate, by saying the eye of the outsider is uneducated, and consequently unable to appreciate such fine distinctions. Knowing how futile it is to attempt to define the word, a species ought to have at least sufficiently constant and distinctive characteristics as may be embodied in an intelligible description; and, moreover, all species ought to

emanate from some locality where they are indigenous, and not from the precincts of a garden wherein the original types have been accumulated, and, in the course of years, have become involved in an almost inextricable confusion of inter-breeding. Our Continental brethren appear to have been perfectly satisfied with the labours of Haworth and Herbert, which they deemed as exhaustive, and hence we find Kunth, in his valuable work on *Monocotyledons*, embodies their ideas almost in their entirety. The next phase that presents itself in the history of the genus is the culminating one. In the spring of 1869, a prize for a certain number of species of *Narcissi* was offered by the Royal Horticultural Society, evidently betokening that, after a long period of neglect, they were again becoming claimants for popular favour. But here arose a difficulty, and a very serious one, as the prize was offered for a number of species—what would be considered by the judges a species, and what a variety? From my foregoing remarks, it will be evident that the judges would be placed on the horns of a dilemma. Fortunately, Mr. Baker, of the Kew Herbarium, than whom no one could be better fitted to solve the difficulty, volunteered his services, and prepared a most elaborate analysis of all the known species, which was duly published that year, and in which the whole category of genera, in spite of their immortal names and mythological associations, were swept away, and *Narcissus* himself re-established, as of old, on his ancient throne. Out of 150 so-called species, only twenty-one were found to bear the stamp and impress of true specific character, those others that possessed permanent distinctions being placed as varieties under the head of their specific types. With this wholesale but judicious reduction I entirely agree—so entirely that I intend availing myself of Mr. Baker's excellent analysis as the basis of the following series of short paragraphs by which I purpose describing the accompanying admirable illustrations, and which I hope will complete an historical, descriptive, and cultural monograph, such as, I trust, may prove of value alike to the amateur and the general cultivator. Before closing these remarks, I ought to say that as some forty years had elapsed between the Golden Age of Haworth and the Iron Age of Baker, nearly all the old collections had died out; hence this vigorous onslaught cannot have been so keenly felt as otherwise would have been the case. Some twenty-eight years ago I found at Kew a collection of about 110 named species, the greater part having originated from Haworth's stock. These I gradually reduced during the five years they were under my charge to fifty-two in number, and many of these I find, on looking over one of my old note-books, are referred to as only varieties. From this it will be readily seen that I was quite prepared to endorse even Mr. Baker's sweeping reduction.

Natural Affinities, Geographical Distribution, &c.

The genus *Narcissus* constitutes the type under which a group of six natural orders, with a tolerably close affinity to one another, are arranged by Lindley in his "Vegetable Kingdom," under the title of the *Narcissal Alliance*. They are botanically characterised by having the ovary inferior, the flowers symmetrical, and the seeds albuminous. The largest of these Orders, and that to which our plant belongs, is *Amaryllidaceæ*, the *Amaryllis* family, an Order consisting for the greater part of plants with extremely showy flowers. This will be at once admitted when I say that, besides our *Narcissi*, we find in its ranks such plants as the *Galanthus* or *Snowdrop*; the *Amaryllis*, in all its lovely and brilliant shades of colour; the *Vallota*, or *Scarborough Lily*; the *Nerine*, or *Guernsey Lily*; the rarer *Griffinia*, with its charming blue flowers; the *Pancratium*, with its delicate purity and delicious fragrance; and the *Crinum*, a very giant among bulbous plants. These and many others that constitute the first two sub-divisions of the Order have all bulbous underground stems. In the third tribe we have the *Alstroemeria* and the *Bomarea*, alike lovely and remarkable for their great variety of colour, producing in place of bulbs fleshy underground tubers; and in the fourth tribe we have the giant *Agaves*—erroneously called *American Aloes*—in which the bulbous character disappears, and is replaced by thick, fleshy, spinous leaves, fleshy roots, and a perfectly arborescent development of flower stem. To the superficial observer the connection of this tribe with

our humble growing *Narcissi* will be somewhat puzzling; but in floral structure there is a sufficiently close analogy to warrant the relationship. The special peculiarity of the *Narcissus* tribe consists in the presence of a distinct cup-like appendage between the petals and the stamens, called by old authors the "nectary," but now more generally known as the "corona," or crown. It is analogous to the ring of filamentous appendages that we are familiar with in the Passion Flower. The origin of this coronal growth is by botanists attributed to a disposition on the part of these plants to develop an increased number of stamens. In the *Pancratium*, an allied genus, the filaments of the stamens are confluent with this appendage, and in some species between each stamen arises a small bilobed process that has evidently a close relationship to a modified anther. Be the origin, however, what it may, we find that this peculiar growth gives us a character of sufficient constancy as to be available for the grouping of the species into three distinct divisions. The geographical distribution of any genus is, to my mind, always a subject of especial interest—how cosmopolitan some plants are found to be; how local others; nor are we always able to assign reasons for these differences. Our *Narcissi* are—so far at least as our present knowledge goes—almost wholly confined to Southern Europe; three or four species extend southward to the Mediterranean shores of Northern Africa; one at least is indigenous to Britain, and found as far north as Sweden, and one appears to extend eastward—through Syria and North India—to China and even Japan. On the other hand, we have not a single species indigenous to either North or South America. True, in the "*Flora Peruviana*" we have one species described under the generic title of *Narcissus*, but it evidently belongs to a distinct genus, *Ismene*, and must be looked upon not as an immediate member of the family, but as a distant relation in a distant land. I admit that I have had bulbs of *Narcissi* sent home from Lima—genuine *Narcissi*—but these have, no doubt, been taken there originally by the Spanish monks; and to a similar source, I am disposed to believe, do two of the three species, which are said by some authors to be natives of Britain, owe their introduction. If the sites of some of the old massive monastic buildings themselves have disappeared, it will surely be a matter of surprise to none that the limits of their old gardens have vanished, and still less that, in the course of centuries, the plants thus introduced will have escaped far beyond those limits, and established themselves in adjacent districts. We have many other instances in which our *Flora* has been originally indebted to this source for some of its so-called endemic plants. Australia has no representative of the genus—nor, so far as my knowledge goes, does it favour us with its analogue. The same remark applies to the Cape of Good Hope. We may, therefore, conclude that the home of our *Daffodils* is Southern Europe, from which they have digressed northward through Britain to Sweden, and eastward, by a very delicate streak through India, as far as Japan. Respecting the medicinal properties of the *Narcissi*, I have already stated that our old herbalists have recorded in their favour, besides many "virtues," as they were wont to term them, not a few vices; and the generally accepted idea is, that the bulbs are somewhat poisonous and emetic. This is confirmed by Lindley and other modern writers; and, further, that the flowers, especially those of the large *Daffodil* of our woods and gardens, are also poisonous, and, when eaten, as they have been by children, have been attended by serious results.

Explanatory Remarks upon Technical Terms.

However popular the writer's aim may be in giving a botanical description of a plant, it is utterly impossible to avoid using technical terms to some extent. Admitting this, it will therefore be advisable that I set myself at one with the reader by offering some remarks explanatory of those terms, and also of the structural points, which are of the greatest value in descriptive botany as applied to any special group of plants. Amongst *Endogens*, to which large primary division the natural order *Amaryllidaceæ* belongs, there is a much greater difficulty in securing well-defined specific descriptive characters than amongst the larger class of *Exogens*; and peculiarly is this remark applicable to the genus *Narcissus*. It arises from the fact that all the leaves are more or less

narrow, smooth in their margins, and springing from that form of underground stem known as a bulb; in whose formation there is little room for variation, except it be in a matter of size, the slight value of which distinction will be familiar to all botanists. Now, in *Exogens*, we have frequently good, tangible, specific distinctions, derivable from these two sources, with the double recommendation that they readily admit of technical description, and, further, that the distinctive character conveyed in such language is both easily understood and readily applied by the student in the process of investigation. The mere measurement of the several parts must be looked upon as a very doubtful assistance in descriptive botany. Those measurements, which would be applicable to a species growing under one set of cultural conditions, would be totally inapplicable to the same species under another set of conditions; nay, further, such measurements as would faithfully represent the plant development one year, might be perfectly inapplicable to the same plant the next season; the reason of this anyone who knows the extreme variability of our climate (and who does not), and also how much plant growth is affected, beneficially or otherwise, by these climatic variations, will at once comprehend. All the species form shortened stems underneath the surface of the soil, which are known by the title of bulbs; the structure of these may be more readily understood if I define them as buds in which, besides the growing point, there are layers of thick fleshy scales, which act in the two-fold capacity of protective appendages and magazines of nutritious matter, the stem proper of the bulb being merely a flattened axis to which the scales are attached. From the centre of this bulb the leaves arise, they and the flower constituting the fully developed condition of the growing point. The leaves vary somewhat in width, and as they are sharp or blunt at the point, are termed acute or obtuse; sometimes they are round in the section like a rush, at other times flattened, with a slightly projecting keel corresponding with the mid-rib at the back; in colour they vary between dark green, generally the predominant characteristic of the rush-like or cylindrical type, or suffused with a greyish tint to which the term glaucous is applied, as in nearly all the broad-leaved sorts. The term applied to the flower-stalk is the scape; it is either cylindrical or somewhat flattened with a slight wing-like process arising from the sides; in the former case it is termed terete, in the latter ancipitous. The scape is terminated by a spathe or sheath, nearly always of a thin membranous character, and enclosing one or more flowers as the case may be. The peduncle is that portion of the stem extending from within the scape to the base of the flower. Important characters, not unfrequently hinge on the relative length of the spathe as compared with the peduncle; this appears, though constant in similar species, to have a good deal of variability in different species. The flower consists of a combination of calyx and corolla, which in *Endogens*, where they possess great similarity, are collectively termed the perianth. A portion of the perianth is tubular; a further portion is expanded in the form of six lobes or divisions, whose relative length with respect to the tube it is important to notice, as also whether they are separate or developed so closely and in such a manner as to overlap one another at their margins, when they are termed imbricated. Another important character hinges on the angle made by these divisional lobes with the tube; sometimes they are bent back or reflexed; more ordinarily they expand at right angles, or, as in one exceptional instance, they form an acute angle, and thus give the appearance as though the flowers were only half expanded. The corona or crown, whose origin I have already alluded to, possesses some very valuable distinctive characters. Variations occur in respect to its length; on the one hand, it may be but a mere marginal rim, and, on the other, a cylindrical process of much greater length and magnitude than the perianth itself; its upper margin may be smooth and undivided, in which case it is termed entire, or it may have notches, which, when deep, are termed lobes; or it may be frilled, as it were, or have a jagged margin; in the former case it would be termed crispate, in the latter scariosa. It will thus, at once, be evident that this sort of fortuitous growth forms an important element in specific descriptions; and, as I said before, according to its greater or less

development; the whole of the species are divided into three groups. The stamens are six in number, the anthers being supported on stalks called filaments that appear to vary in length according to the size of the corona; where the latter is short the filaments are scarcely developed at all, and usually three only of the anthers are visible in the neck of the tubular part of the perianth, the remaining three being developed at a lower level; where the corona is long and expanded the filaments are well developed, and in that case appear to bend slightly downwards and then curve upwards, to which the term declinate is given. The pistil, whose ovary occurs in the form of a small egg-shaped or lobed green process at the base of the tube of the flower, possesses a style of sufficient length to elevate the stigma to about the level of the three uppermost stamens; sometimes it protrudes beyond, in which case it is termed exserted. This, however, is of rare occurrence.

Grouping of Species.

Though some authors have grouped their species according to the shape of the leaves, I prefer adopting the development of the corona as a more constant character, and, in so doing, follow in Mr. Baker's footsteps, than whom, I believe, no better leader could be selected. To our first group, therefore, the title "large-crowned" fully expresses the fact that it contains all those species in which the corona equals or exceeds in length the divisions of the perianth. The second group—medium-crowned—will include all those in which the crown is about half the length of the perianth; or, in some cases, slightly in excess of that proportion. The third—small or short-crowned—includes all those species in which the length of the crown is less than one-half the length of the perianth; and, in some cases, so much less that it becomes little more than a marginal line.

Group I.—Large-Crowned.

Under this title we have, according to Mr. Baker, but three distinct species, viz. :—

I. *Narcissus Bulbocodium* of Linnæus.—The typical plant upon which Haworth based his genus, *Corbularia*, possesses the



Hoop-petticoat *Narcissus*.



Wavy-leaved *Narcissus*.

following distinctive characters :—The bulbs are ovoid, small, coated with dark-brown membrane scales; the leaves are two or three in number, almost cylindrical and rush-like, of a dark-green colour, rather longer than the flower-stalk; the scape slender and terete, carrying a single partially-erect flower; the pedicels being short and surrounded by the membrane spathe; the perianth gradually widening from the ovary—the divisions linear lanceolate, narrowing into an acute point about the same length as the crown; the crown wide, expanded, or funnel-shaped, the margin circular, almost entire; stamens, six in a double rank; filaments, sufficiently long to bring the anthers to a level with the mouth of the corona, slightly declinate; the pistil exserted. The flowers are a brilliant yellow, little variation occurring between the corona and the perianth. They are produced about the middle of May. This species is known as "the Hoop-petticoat *Narcissus*," a name arising from the similarity of the corona to the fully-distended petticoat of the last century. It is a native of the coast of France, from Bordeaux southward to Spain and Portugal, and occurs also in the north of Africa. Culturally speaking, this is a somewhat delicate species, growing freely in light soil, and especially loving a mixture of peat, loam, and sand on a dry sub-soil. In damp low-lying ground the bulbs are liable to rot off in the winter

time. Amongst the whole of the *Narcissi* we have no more showy plant than the Hoop-petticoat *Narcissus*. It is adapted both for outdoor culture—when the soil and sub-soil suits—and for indoor culture, where the intense brilliant yellow of its blossoms, contrasted with its dark-green leaves, recommend it for spring decoration in the conservatory. It is not, however, amenable to very early forcing, as its blooms are liable to go blind. Amongst the varieties of this species which possess tolerably constant characters, and are in pretty general cultivation, we have four varieties :—

Var. 1. *B. conspicuum*, the *Corbularia conspicua* of Herbert.—It is in all respects a major form, with the margin of the corona slightly wavy, and is synonymous with Haworth's *Corbularia gigas* and *aurea*.

Var. 2. *B. tenuifolium*.—In which the plant is altogether smaller and the leaves more slender and twisted.

Var. 3. *B. serotinum* differs from the typical species, in having a much more widely expanded corona, and broader divisions of the perianth, and in its flowers standing well above the peculiarly twisted foliage.

Var. 4. *B. monophyllum*, synonymous with *N. Clusii* of Dunal.—I have my doubts whether this should not be retained as a distinct species. It differs from all the others in its flowers being almost white, in its producing one leaf only, or in rare instances two, and in its exceedingly dwarf growth. In respect to its cultural peculiarities it stands alone; once only have I flowered it, from bulbs sent me from the Jardin des Plantes, Paris. The past summer is the second during which the same bulbs have laid dormant; not a vestige of growth have they made, and yet they are perfectly fresh. The same remark applies to several bulbs I had from the authorities at Kew three years ago. It is a native of Barbary and the north coast of Africa, where, I



Common Daffodil.

am told, it grows and flowers freely enough. Why, then, should it be so stubborn in cultivation with us? Clearly, some of the special conditions which will warrant success are wanting to us. Perhaps some of your correspondents who have been more successful, or who have seen it growing wild, will kindly favour us with a detailed account of the conditions under which it flourishes in its native habitat.

II. *N. Pseudo-Narcissus* of Linnæus is the true Daffodil, with which we are all familiar from our earliest childhood. It is the typical plant upon which Haworth constituted his genus *Ajax*. The bulbs of this species are egg-shaped, and fully twice the size of the previous one; the leaves are produced in fives or sixes, broad, erect, flat on the upper side, and slightly keeled below, of a greyish-green (glaucous), somewhat shorter than the scape at the time of blooming, but increasing in length afterwards; the scape is about 12 inches high, flattened, and presenting two prominent edges; the flowers, solitary, the short pedicel completely included in the sheath; the tube of the perianth about half an inch long, ob-conical, the divisions slightly spreading, each alternate one rather blunter; the crown, equal in length to the divisions, somewhat plicate at the mouth, and irregularly notched at the margin, the stamens rising in one series from the base of the tube; the colour is yellow, the crown being of a deeper tinge than the perianth; one of the earliest blooming of the *Narcissi*, coming into flower about the middle of March. It is a native of Britain, but rare in Scotland; it is found also as far north as Sweden, and is pretty generally distributed through Spain, Portugal, and Transylvania. Under this species we have five or six very distinct varieties.

1. *Pseudo Narcissus plenus* and *plenissimus*.—The former is the ordinary double variety; the latter, as the name indicates, is a much more extreme form of reduplication; it is much more dwarf in habit and is a variety rarely met with.

2. *Pseudo Narcissus, major*.—Synonymous with Haworth's *N. maximus* and Salisbury's *grandiflorus*. This is, in every respect, a plant of larger growth, besides which the petals are more expanded and the crown wider at the mouth and more crisped than in our typical species; the leaves, also, are twisted. It has been thought by some that the above variety, *plenissimus*, is the double form of this, which I should be disposed to admit, were it not for its markedly diminished stature.

N. Pseudo Narcissus, var. 3 bicolor.—The old *N. bicolor* of Linnæus.—A very handsome variety, differing chiefly in the fact that the

perianth is of a pale lemon-yellow, whilst the crown is a deep golden colour; it flowers nearly a month later than its type, and is by no means so frequently met with in cultivation.

N. Pseudo Narcissus, var. 4. *moschatus*.—Synonymous with *N. cernuus*, of Haworth, and very probably with *N. Sabini*, figured in the *Botanical Register*, possibly the latter may be a garden hybrid. This variety has a similar development to the type, and differs chiefly in the fact, that the flower, in all its parts, is coloured alike of a pale sulphur-yellow, almost approaching to white. Why this name was especially given, I am at a loss to discover, as I have never been able to detect any musky character in its fragrance. In this variety the corona generally exceeds in length the divergent petals, which are more or less twisted.



Musk-scented Narcissus.

N. Pseudo Narcissus, var. 5 *minor*.—This most interesting and earliest blooming of all the Daffodils will be familiar to many under some of the following synonyms: *N. nanus*, *pygmæus*, *pumilus*, and *exiguus*. Its stature does not exceed 5 or 6 inches, and in all its parts it presents the appearance of a diminutive form of the type; how this character has become so confirmed it would be difficult to say; but we find it has altered nothing during three centuries of garden culture, and the figure given by Dodonæus is unmistakably the identical plant of the present day. It is not often one sees a variation so constant. It is a native of Spain. Its neat compact habit, and its early blooming, are characteristics which must commend it for general culture. I am quite disposed to believe that there are two very distinct forms of this minor variety readily appreciable by those who are familiar with them in a living state; but these distinctive characteristics appear, like the acrid poisonous matter of many plants, to evaporate in the process of drying.

III. *N. Calathinus* of Linnæus (*N. reflexus* of Brotero) is quite distinct from that figured in the *Botanical Magazine* under that name. The general appearance of the plant, both as to floral structure and growth, is admirably given in the accompanying figure. The bulbs are not half the size of the preceding species; the leaves are generally in threes, very slender, and of tolerably bright green, and concave on the face. The scape is also slender and rounded, rising to a height of 8 to 12 inches; flowers, one or two on a stem, supported on long pedicels that raise them clear of the spathe, and give them a drooping character. The tube of the flower is very narrow, and, in this respect, quite distinct from the preceding species. The divisions of the perianth are almost oval, tapering off at either end, and completely reflexed. The crown is about the same length as the divisions, tending in shape more to the globose than the cylindrical; the margin is merely indented into six smooth lobes; the stamens are arranged in a double series, but do not protrude into the corona; the colour of all parts of the flower is a pale yellow, and there is some record of a pure white form. It blooms in the latter part of April. This is both a handsome and a rare species, not only rare in cultivation, but also rare so far as its ascertained localities are concerned. Mr. Baker records two habitats, one on the island of Drenec, one of the Glenans, on the coast of Brittany; the other in Portugal, on the authority of Baron Paiva. I once had the true species in cultivation, and flowered it, but it died the following season; nor, indeed, does Mons. Thuret appear to have had much better success at Antibes. A tolerably clear reason for our want of success is to be found in the conditions under which it grows in its wild state. It appears that the short Grass amongst which it is found abundant enjoys the influence of an extremely mild and moist climate, and is also continuously and copiously watered by the salt spray from the sea. It is presumed by some that this island is the only known locality for this interesting species of *Narcissus*.



Reflexed Narcissus.

Group II.—Medium-Crowned.

The crown is about one-half the length of the divisions of the perianth. In this group Mr. Baker enumerates but seven species, five of which only are known as really wild plants, and specimens of which occur in the herbaria from their respective habitats.

IV. *N. triandrus* of Linnæus (the *Ganymedes triandrus* of Haworth), is one of those few specific names in which Linnæus may be caught tripping. The inference one would naturally draw from the name is that the flower possesses but three stamens, and although only that number present themselves at the mouth of the tube, there is a second series, unobservable, a little lower down, which the mechanical opening of the tube at once displays. It would appear that Haworth was as equally at fault as his great predecessor, and adopted the *triandrus* specific character. Possibly the three lower stamens may be sometimes abortive; but in the plants I have grown the six perfectly-developed stamens were evident enough. The bulb is very small, not more than half an inch in diameter, somewhat elongated. The leaves, usually in threes, exceedingly slender and semi-cylindrical, 6 to 8 inches long, of an olive-green; scape, two-flowered, about 8 to 12 inches high, slender; the pedicels of the uppermost flower long, and clearing the spathe; that of the lower one scarcely protruding from it; the tube of the flower slender and cylindrical;



Cyclamen-flowered Narcissus.

the divisions of the perianth lanceolate and reflexed; the crown obconical, with an almost entire margin; stamens in two distinct series, the upper inserted near the mouth of the tube, the lower at a point considerably below; the flowers, both as regards tubes, petals, and corona, are pure white and pendulous. It is a native of Spain, being tolerably abundant in the Pyrenees, where it blooms in the month of April, but in cultivation in this country its blooming season is nearer the middle of May. The figure in the *Botanical Magazine* differs from the above description

as regards colour, as it is there represented of a pale yellow tint. This is, no doubt, the true form of the var. *cernuus*. The exceeding slenderness which characterises all the parts of this plant gives it a grace and elegance which few of the *Narcissi* possess; consequently it ought to be more generally cultivated. It is perfectly hardy, but does not increase so rapidly as other species, and, where planted out, it ought to have a little carefully-prepared light compost for itself. There are several varieties worthy of record.

Var. 1, *pulchellus*, in which, while the corona is white, the divisions of the perianth are yellow. It is identical with the variety *luteus*, as figured in the *Botanical Magazine*.

Var. 2, *cernuus*, the flowers pale yellow, conical, and rather more vigorous in general habit of the plant than in the type. This is no doubt the plant figured as *triandrus* in the *Botanical Magazine*.

Var. 3, *nutans*, is a much stronger-growing plant, in which the margin of the crown is crenulated, not smooth and entire. As figured in the *Botanical Magazine*, it has very much the appearance of a hybrid, between the Jonquil and our present species.

V. *N. montanus* of Lindley is a name under which this species



White Mountain Narcissus.

is more generally known than that of Salisbury, adopted by Mr. Baker—viz., *poculiformis*. It is also the *N. galanthifolius* of Haworth. The bulb is of moderate size; the leaves are broad and flat, four to five in number, and shorter than the scape, which is about a foot high; flowers, usually produced in pairs, drooping, the upper one on a lengthened pedicel; the tube, short and cylindrical; the divisions of the perianth, oblong, lanceolate, often twisted; the crown, slightly expanded at the mouth, moderately plicate and crenulate; stamens, almost sessile, in two series; the anthers, exerted from the mouth of the tube; the flowers are white, and possess a delicate perfume. Lindley supposes this plant to have been introduced from the East, possibly from Smyrna; but Baker distinctly says that it is only known in gardens, and

supposes it to be a hybrid production. Be this as it may, it is a very distinct form, and a free grower, though rarely met with in cultivation. Its fragrance is not the least desirable of its attributes.

VI. N. Macleaii of Lindley, figured in the *Bot. Register*, has bulbs about 1 inch in diameter; leaves five to six, somewhat shorter than scape, broad, blunt, pointed, and bright green, concave on the face; scape about 1 foot high, bearing one or two partially erect flowers; the tube cylindrical, white, tinged with green towards the base; the divisions of a milky-white colour, spreading at right angles to the base of the corona, broad, rather blunt-pointed, and overlapping one another; the crown of a bright yellow, slightly plicate and lobed at the margin; stamens rising from the middle of the tube, nearly in a single row. Like the last species, this very distinct form is only known in cultivation, there being no record of it as a wild plant. It appears to have some resemblance to the bicolor form of *Pseudo Narcissus*, but this arises more from a similarity in colour than from its structure, which is quite distinct. It blooms in the early part of April.



Macleay's Narcissus.

VII. N. incomparabilis of Curtis, in the *Bot. Magazine*, is the type of Haworth's genus *Queltia*, and with it is incorporated his *Queltia concolor*, *Q. ampla* of Salisbury, and *Q. foetida* of Herbert. Bulb, smaller in size than that of the Daffodil; leaves, broad, three to four, distinctly keeled below, and glaucous; scape, compressed, and two-edged, about 15 to 18 inches long, supporting one solitary partially erect flower; pedicel, short, almost included in the large spathe; expanded flower, 2 to 3 inches in diameter; tube, short in proportion, and cylindrical; the divisions of the perianth spreading, slightly imbricated; crown, broadly campanulate and undulating, crispate at the margins; stamens, arranged in one series; style, exserted beyond the stamens. Next to the *Pseudo Narcissus*, this—which is well named the Peerless Daffodil—is one of the commonest in cultivation. Its flowers are yellow, with a deeper tint in the crown. It is in stature one of the tallest of our Narcissi, its handsome flowers waving above the leaves, which they exceed in height by 5 or 6 inches. Though recorded by Parkinson, it appears to have been overlooked altogether by Linnæus. It is an early bloomer, sometimes rivalling in this respect the common Daffodil, and is a native of Spain and France, extending as far even as the Tyrol.



Peerless Narcissus.

Var. 1, *incomparabilis plenus*, the double form with which the juvenile mind has not unhappily associated the idea of "butter and eggs," to which, indeed, the mixture of the two colours within the corona bears no inapt resemblance. Met with in cultivation almost as frequently as the single.

Var. 2, *incomparabilis aurantius*.—This, though long considered a species, must be looked upon as nothing more than a larger form of the type, with lemon-coloured divisions and crown of a deeper orange. There is a double form of this also, which is known in gardens as the Nonpareil.

3. *incomparabilis var. albus*, still retaining the orange crown, but with milk-white divisions of the perianth. This is a very distinct variety, and much rarer in cultivation than either of the former; the double form of this is distinguished by the popular garden name of the Orange Phoenix. Whence its origin I am unable to say.

VIII. N. odoratus of Linnæus.—This is the plant figured in the *Botanical Magazine* as *N. Calathinus*, and is also the type on which Haworth founded his genus *Phylogyne*; of these he described half-a-dozen species, but they are scarcely even entitled to be called variations, at least as I have grown them. Bulb, egg-shaped; leaves, three or four, about 12 inches long, and half the width of those of the preceding species, quite concave on the face, and convex at the back, of a bright green colour; the scape, 12 to 15 inches long, nearly cylindrical, with the slightest angularity at the opposite sides; flowers in pairs, or sometimes in threes; the pedicel of the upper

sufficiently long to clear the spathe, that of the lower short and included; the tube of the perianth much more slender than that of the previous species; the divisions ovate lanceolate, slightly overlapping one another at the lower part, and spreading at right angles with the tube; the crown neither so expanded as that of *incomparabilis* at the mouth, nor so crispate at the margin, but generally notched into six lobes, sometimes deeply so, at other times very slightly. On this character, which, to say the least of it, is a most inconstant one, varying considerably even in flowers on the same plant, Haworth based the several distinct species before alluded to. The stamens protrude somewhat beyond the tube of the perianth, and the style is exserted. The colour of the flowers is a fine clear yellow, slightly increased in depth in the crown. It produces sweet-scented blossoms about the middle or end of April. Native specimens give Spain, the South of France, and Dalmatia as recorded habitats of this species. I have, however, always had a strong notion that in it we have a plant so distinctly intermediate between *incomparabilis* and the sweet-scented Jonquil as almost to point out its origin from this double parentage. It is popularly known as the great Sweet-scented Jonquil, and as such is recorded by Parkinson, and



Sweet-scented Narcissus.

was cultivated by Miller as the larger Jonquil; be this as it may, it appears to retain its characters very constantly in cultivation, as the present plant is identical with the somewhat rude figures of the early herbalist.

1. *N. odoratus var. lætus*, more familiar in cultivation under Haworth's name of *Phylogyne Curtisii*, is a sort of minor form, one, indeed, that approaches more nearly, in every respect, even the shorter-crown, to the Jonquil than the typical species.

IX. N. juncifolius, of Requien, is synonymous with *Requienii*, of Roemer, also *Queltia pusilla*, of Herbert.—The name adopted is decidedly the most characteristic. The bulb in this species is exceedingly small, scarcely $\frac{1}{2}$ inch in diameter; the leaves are quite cylindrical and tapering, of a bright shining green, closely resembling those of a rush, 5 or 6 inches long, and occurring in threes and fours; scape, about the same height as the leaves, quite round and very slender; the flowers are generally two in number, sometimes reduced to one, or more rarely extended to three; the pedicels very short, so that the flowers appear to spring from the



Rush-leaved Narcissus.

spathe; tube of perianth cylindrical, very narrow, divisions freely expanded broadly obovate, each terminated by a little projecting cuspis or point, imbricated at the mouth, slightly notched and considerably broader than deep; stamens, in two series the upper just protruding beyond the mouth of the tube, the lower series some distance down in it, the style included. This species possesses thoroughly well-marked distinguishing characters, but is one of the smallest and

slender growers of all the Narcissi, its flowers are of a bright yellow throughout, and are produced, according to Baker, about the middle of April, but with us they rarely expand before the first or second week in May, and to my mind its diminished stature gives it a special beauty of its own, enhanced perhaps by the fact that it is an unmistakable species. It is a native of Spain and the south of France, and, like nearly all the slender growers, appears

require a mixture of peat in the soil as well as an abundance of sand, a good supply of moisture when in growth, and perfect dryness when at rest; for this purpose a sunny, sheltered corner in the select rockery should be devoted to its culture.

N. juncifolius var. *gaditanus*, I have never seen in cultivation—on it the limb of the perianth is exceedingly short, scarcely as long as the crown; it is, if I remember rightly, figured by Boissier in his Spanish plants, as a distinct species, under the name of *N. gaditanus* but is so closely related to our present species that no doubt Mr. Baker is quite justified in making it a variety.

X. *N. dubius* of Gouan; synonyms, *N. pallidus*, Poir and *Fernione dubia*, Haworth. The bulbs are nearly twice the size of the preceding species; the leaves are from four to six in number, rather broader, channelled on the inner face, and slightly recurved at the margins, as shown in the small portion of the full-sized leaf in the figure, they are also somewhat glaucous, and 5 to 6 inches long; the scape rather exceeds the leaves—it is slender, compressed, and has two marginal nerves well defined; the flowers are two to six in number, the upper ones elevated on long pedicels, considerably exceeding the spathe in length; the tube, cylindrical, narrow; the divisions of the perianth broadly ovate, spreading, or slightly reflexed, blunt-pointed, imbricated; crown, rather contracted at the mouth than extended, slightly crenulated along the margin; stamens most sessile, and, with the style, just protrude into the base of the corona. I have never seen this species in cultivation, being only familiar with it from Moggeridge's excellent figure. The flowers are pure white; and, were it not for its broader leaves and compressed scape, it might, from its small stature and other general characters, be taken for a variety of *juncifolius*. Now that good distinct forms of the narcissi are in such request, and seeing that it grows in the neighbourhood of Nice, no doubt we shall soon have the pleasure of making its personal acquaintance. It is mentioned as growing wild at Nice, well as at Toulon, Marseilles, and Avignon. Judging from its appearance, I should take it to have a much more vigorous constitution than the preceding, and likely to become a more popular plant.

Group III.—Small-Crowned.

Crown, less than half as long as the divisions of the perianth. This, a third group, comprises eleven species, with many of which we are quite familiar in cultivation. If in the preceding sections, it was not necessary to absorb a host of so-called species, in this, the last section, will be found a still greater array to be dealt with, and a still greater reduction to be made.

XI. *N. Tazetta* of Linnæus, and its varieties, stand as representatives for upwards of forty-six of Haworth's so-called species. Amongst the whole number the difficulty is to say which is the original *Tazetta* of Linnæus. The description in his *Species Plantarum* is both short and indefinite; and, though sufficiently definite to enable us to distinguish one of this exceedingly variable section from the other species described by him, still leaves a matter of great doubt as to which is the exact form he had in view. In this state of uncertainty it is doubtful whether it would not have been better to have made the expressly descriptive name *Polyanthus* a representative one; the more so, in popular parlance, all these are known as *Polyanthus Narcissi*, and as they are imported from the Continent in large quantities for forcing purposes, for which their free growth, light and variable colours, and delicious perfume, render them exceedingly well adapted. The plant, figured under the name *Tazetta* in the *Botanical Magazine*, is, I see, referred by Baker to the variety *aureus*, on account of the bright yellow colour of its flowers, which, as well as one or two other characters, appear to identify it



White-flowered Narcissus.



Little-cupped Narcissus.

as the *N. aureus* of Loiseleur. The bulb of our typical plant is large, 2 inches or more in diameter, covered with chocolate-brown membranaceous scales; the leaves four to six in number, broad, flat, bluntly keeled at the back, of a lightish glaucous green; scape, 12 to 15 inches; compressed and furnished with two projecting lines; number of flowers variable from four to eight, all supported on pedicels of sufficient length to raise them clear of the large membranaceous spathe; the tube and limb of the perianth are both white, nearly of equal length, the latter divided into broad imbricated lobes, blunt at the point and extended into a short cuspidate process, more or less clearly defined. The divisions sometimes slightly reflexed; the crown forms a shallow cup-like process of bright golden colour, almost entire or very slightly lobed at the margin; the anthers sessile in a double series, the upper ones just projecting beyond the mouth of the tube. Its habitat extends eastward through Syria into Cashmere, and even into China and Japan—hence the origin of one of its synonyms, *N. orientalis*, which is a most appropriate name. The varieties, eight or nine in number, which appear to be sufficiently distinct and constant to require chronicling at our hands, naturally group themselves into three divisions according to colour. The first includes those in which the perianth is white and the corona yellow. The second those in which both perianth and corona are pure white, and the third those in which the flowers are entirely yellow.

FIRST DIVISION.

N. Tazetta, var. *mediterranea*, has narrower divisions of the perianth, scarcely at all imbricated, and decidedly more reflexed; the bulb also is smaller than in the typical plant.

Var. *polyantha*, as the name implies, produces a great number of flowers in each scape, varying from eight to twenty; the bulb is nearly 3 inches in diameter; it is one of the most vigorous growers in the whole group, and we may take that variety, so popular in our Continental importations, known by the title of *Grand Monarque*, as illustrative of this form.

Var. *ochroleuca* differs from the foregoing in the darker green of its leaves, which are more convex at the back, and not so distinctly keeled. The citron-coloured corona is larger and more entire in its margin, and the colour, as a white, somewhat less pure, hence the name *ochroleuca*.

SECOND DIVISION.

Var. *papyraceas* (the Paper-white Narcissus), has broad glaucous leaves, a distinctly ancipitous stem; tube of the flower, slightly tinged with green; perianth and corona, a perfectly pure white, the latter distinctly crenulate and scarious at the margin.



The Intermediate Narcissus.

Var. *Panizziana*, along with all the purity of colour possessed by the former, is smaller in all its parts, the divisions of the perianth being separate, and not overlapping one another. This variety I only know from Moggeridge's figure. Presuming that the characters are constant, it is a very distinct form.

THIRD DIVISION.

Var. *italica*.—This is the *N. italicus* of the *Botanical Magazine*, a plant of slender growth, producing numerous flowers on a scape; the divisions of the perianth scarcely imbricated, of a pale yellow, the colour of the corona being a similar yellow, a little more intensified; the corona is distinctly six-lobed.

Var. *chrysantha*, a variety with small yellow flowers, not more than 1 inch in diameter; the divisions of the perianth imbricated; the crown a rich golden-yellow, almost entire at the margin.

Var. *aureus*, has flowers as large as *italica*, the petals broad and densely imbricated, of a brilliant yellow; the corona almost entire, bright orange-yellow.

XII. *N. intermedius* of Loiseleur.—Bulbs about an inch in diameter; leaves, three to four, almost cylindrical; of a dark shining green, about the same length as the scape, which is from 12 to 15 inches long. The flowers are from two to five, on pedicels sufficiently long to protrude beyond the spathe. The tube is long and narrow in proportion to the size of the flower; the divisions of the perianth are broadly ovate, narrowing to the point, and imbricated at the base; of a pale lemon colour; the crown of a deeper yellow, plaited, and slightly crenulated; anthers, almost sessile. This

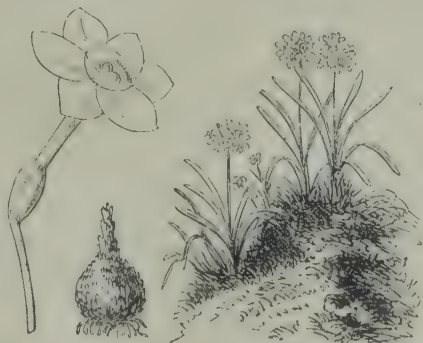
is frequently cultivated as *N. bifrons* and *N. bicrenata*. It is a native of the south of France, Spain, and the Balearic Islands. It gets its title from its apparent close relationship on the one hand to the Tazetta, and on the other to the Jonquil, and combines many of the leading characteristics of both species. If, however, it be a hybrid—as I strongly suspect—it is one of Nature's sports, and enjoys a fairly wide distribution with little or no variation. Mr. Baker records one variety only under the title of *N. intermedius radiatus*, in which the divisions of the perianth are narrower, and, consequently, less imbricated, and the crown also distinctly six-lobed. Synonymous with the *Hermione compressa* of Haworth. This form I have not myself seen in cultivation.

XIII. *N. gracilis* of Sabine, in the *Botanical Register*, is no doubt the same plant as that figured in Curtis's *Botanical Magazine* under the name "tenuior," both of which are very possibly modern names for Wildenow's "*angustifolius*." His description is, however, so indefinitely brief, that it would be rash to conclude what plant he really did mean. Our plant has exceedingly slender bright green leaves, four to six in number, semi-cylindrical, with a deep semi-circular channel on the inner side; the scape rises above the leaves, is slightly compressed, and is usually one or two-flowered; the tube of the perianth is very narrow, the limb dividing into broadly obovate segments, each terminated by a sort of cuspidate point, the whole overlapping one another in a marked degree, and of a very full sulphur-yellow; the crown is cup-shaped, with an expanded margin, slightly plicate and crenulated, of a bright golden colour; the anthers are almost sessile, arranged in two series. This species, though long in cultivation, and having originated, in the first instance, from Holland—a somewhat suspicious source, by the way—has never yet been found growing wild; hence, its claims to specific origin are doubtful. It is more probably a hybrid, with a little of the Jonquil and Poet's *Narcissus* combined in the leaves, and a similar mixture of these two, with the addition of a little Tazetta blood in the flowers. Be this as it may, it has, through a long series of years, retained a very distinct appearance, and to that fact it is indebted for its specific honours.



The Slender Narcissus.

XIV. *N. pachybolbos* of Durieu, as the name implies, has a large bulb of from 2 to 3 inches in diameter, covered with brown rough corrugated scales, differing in this respect from all other species; the leaves are four in number, glaucous, flat, about a quarter of an inch wide, slightly keeled at the back; scape, about a foot high, compressed, and ancipitous; tube, pure white, half an inch long above the ovary, expanded portion of the perianth little more than half an inch across, the divisions blunt-pointed or nearly rounded, much imbricated, and slightly cuspidate, also pure white; crown, saucer-shaped, very shallow, almost entire, and, like all the rest of the flower, perfectly white; stamens, in a double series, almost sessile. This is a modern Algerian species, somewhat closely related to Tazetta, from which it differs chiefly in the exceeding smallness of its flowers, and the rough corrugated character of the outer scales of its bulbs. I am not aware that it is at present in cultivation in this country; but find a memorandum recording it in a list of Algerian plants sent to the garden at Montpellier some years ago, from which I was in hopes to have obtained it.



Great-bulbed Narcissus.

XV. *N. Jonquilla* of Linnæus, is the well-known favourite old Jonquil of our gardens, whose cultivation extends, in this country, over a period of nearly three centuries. The original name given to it by the Spaniards was *Jonquillas*, hence the specific title adopted by Linnæus. Though often confounded in books, especially in old works, with *N. juncifolius* (already described), it is perfectly distinct, possessing, as it does, the exceedingly small crown characteristic of this section, along with a more erect growth of foliage and larger development altogether. Those authors who group the species

according to the leaves would, of course, be justified in placing these two species in juxtaposition. It may appear almost unnecessary to give a description of a plant so well known as the Jonquil; but as it is worthy of a figure, which, by the way, gives a capital idea of the general contour of the plant, it must also be considered worthy of a description. The bulbs are small, scarcely an inch in diameter, more globular than the generality of the *Narcissus* heretofore passed in review, and surrounded with a thin dark brown outer scale; the leaves are usually in pairs, of a deep glossy green, nearly cylindrical with a groove or channel down the face



Common Jonquil.

scape, rather shorter than the leaves, slender and terete, supporting from two to six blossoms; the tube is nearly an inch long, the divisions of the perianth are broadly lanceolate and slightly cuspidate, scarcely at all imbricated; the crown is saucer-shaped, very shallow and slightly crimped at the edge; anthers almost sessile, in two series, the upper just protruding beyond the mouth of the tube. In colour, the flower is throughout its parts a clear golden-yellow, and possesses a delicate and delicious perfume. It blooms about the end of April or beginning May. It is a native of Spain, France, Italy, and Dalmatia. In cultivation, it is by no means so vigorous a grower as many of the other *Narcissi*, and, if left undisturbed for a series of years, is rather apt to dwindle away, the flowers becoming solitary at first, and then



The Greater Jonquil.



The Double Jonquil.

disappearing altogether. There are three fairly distinct varieties, viz. :—

N. Jonquilla plena, the double form which is pretty common in cultivation; but, under unfavourable conditions of culture, is liable to lose its duplex character.

N. Jonquilla major.—Here, as the name indicates, all the parts are larger, and the constitution of the plant appears to be altogether more vigorous—a character which it retains with considerable constancy.

N. Jonquilla minor.—A lesser form than our typical plant, dwarfed in growth—both of foliage and flower-stalks; the divisions of the perianth narrower, somewhat reflexed, and slightly twisted. The latter peculiarities appear to me to indicate that it is something more than a mere weakly form induced by bad culture, to which it has been referred by some authors.



Twin-flowered Narcissus.

bulbs are of medium size, rather above an inch in diameter; leaves about four in number, broad, flat, slightly glaucous, bluntly keeled at the back. The scape is compressed and ancipitous, bearing

XVI. *N. biflorus*, figured and described by Curtis in one of the early volumes of the *Botanical Magazine*, is known as the "Twin-flowered Daffodil," a peculiarity which its expressive specific name at once conveys. I am bound, however, to admit that I have seen it occasionally only once-flowered, and more rarely producing three flowers from a scape.

ally two flowers; the spathe is long and erect, standing well above the pendent blossoms; the tube as well as the divisions of the perianth are of a milky-white colour; the latter expanded, flat, with their margins slightly undulate; individually they are broadly obovate, blunt-pointed, and imbricated; the crown is cup-shaped, deeper than either the preceding or succeeding species, and has a spreading scariously crispate margin, of a light lemon colour; stamens, sessile, arranged in one series, and included in the tube of the perianth. Whether this plant is or is not a real original native of Britain, it is scarcely necessary here to discuss; suffice it to say that Gerard and others of our old writers allude to it as in their time growing abundantly in many of the western counties of England; so, if it be an introduction, it must be considered as fairly naturalised in its new home. It flowers about the end of April, and is very sweet-scented. On the Continent it is abundantly distributed through France, Switzerland, Italy, and the Tyrol. It is of a strong vigorous constitution, and appears to enjoy a long-continued undisturbed possession of a locality, being always happiest when growing near the margin of a wood.

XVII. N. Poeticus, of Linnæus.—The Poet's Daffodil, or more readily recognised by its popular appellation, the "Pheasant's-eye Narcissus," a name derived from the beautiful margin of crimson colour that surrounds the corona, is another of the thoroughly naturalised Narcissi of Britain, and certainly the most classical and lovely of the three, that we lay claim to as indigenous plants. I believe there is some doubt whether this is the original poetic Narcissus, or the *N. poetarum* of Haworth (literally the Narcissus of the poets), but in order to disperse the doubt, if any there be, we roll them both into one, so far as any specific



Poet's or Pheasant's-eye Narcissus.

Double Poet's Narcissus.

ue is concerned, merely recognising that of Haworth as a variation; nor do our absorptive propensities cease there, as we place several others to a similar state of subjection. I hope our friend Mr. Leeds, of Manchester, will look upon our wholesale specific slaughter as endorsed by something more than a mere poetic license—to our description. The bulbs are about an inch in diameter, the ves, usually produced in fours, flat and glaucous, with a blunt point at the back, possessing less substance than those of the last. The scape is about a foot high, or more when growing in a shady locality; flowers solitary, or very rarely produced in pairs; the pedicel short, so that the flower expands just clear of the spathe; the tube of the perianth rather better than an inch long; the divisions obovate, blunt, and slightly cuspidate, moderately imbricated, of pure papery-white colour; the crown is saucer-shaped, very shallow, yellowish at the base, much crisped along the edge, the irregular lines formed being margined with a well-marked line of crimson scarlet; the anthers are sessile, arrayed in one series, some of them projecting slightly into the base of the crown. The Pheasant's-eye Narcissus is deservedly a popular plant. The white contrasts with the tiny crimson margin so perfectly as to make it almost, amongst flowers, the very type of simple modest beauty, such as, no doubt, Narcissus himself was, ere the sight of his own reflection roused his dormant vanity. Those of my readers who have seen a good bunch of the flowers of this Narcissus (100 blooms), all grouped together, intermingled with a few of brown leaves, will, I am sure, agree with me when I say that it possesses a charm which only those who have seen can possibly appreciate, and a fragrance, though perhaps too powerful *en masse* for the conditions I allude to, yet individually the flowers yield a delicious perfume. Our plant blooms about the end of April or the beginning of May, depending, no doubt, a good deal on the character of the season. Besides being naturalised in Britain, it grows abundantly through the south of Europe, from France as far as Greece,

where it is generally found affecting somewhat moist upland meadows. As a number of species are included under *N. poeticus*, so we are obliged to recognise several distinct varieties, and, I am bound to say, very constant varieties too.

Var. 1, *M. poeticus plenus*, the double-flowered form, pretty frequently met with in old-fashioned country gardens, and a great favourite in the old country nosegay. It blooms nearly a fortnight later than the single; and, for any additional beauty it may acquire in the multiplication of the petals—pure as they may be and are—it loses quite as much in the absence of the crimson-margined cup, whose broken fragments may be discovered on a minute investigation; in fact, I take it that, whereas the single represents Narcissus in his simple unconscious beauty, the double form is typical of the ruffled feathers of his conscious vanity, the charm of simplicity having been sacrificed in substituting the questionable one of duplicity.

Var. 2, *radiiflorus*.—This is admitted as a distinct species by both



The Green-flowered Narcissus.

Var. 3, *recurvus*.—This is a late-flowering slender form, in which the divisions of the perianth are reflexed and wavy along the margins. It appears to retain its character very constantly under cultivation.

Var. 4, *Poetarum*, the *N. Poetarum* of Haworth and the poeticus var. *grandiflorus* of Herbert. This is a much larger form than our original type, the flower is nearly 3 inches in diameter, and the divisions overlay one another to a very great extent, and are not at all reflexed. This, I believe, is the plant figured in the "English Botany" as our native type of *N. poeticus*.

XVIII. N. viridiflorus of Schousboc, and the three following species, are all peculiar, in the fact that they are autumnal bloomers. Our present species is figured in the *Botanical Magazine*, and will always have a much higher claim to botanical than to popular interest. Its bulbs are small, almost round, and furnished with a brown membranous covering, each producing one or two terete fistulose leaves, tapering to the point; the scape, slender, terete, one to four-flowered, the spathe rather exceeding the pedicels in length, the tube of perianth gradually narrowing from the top of the ovary to the throat, the divisions narrow, reflexed somewhat as to the margins,



The Elegant-flowered Narcissus.

and *C. intiger* of Haworth, and is a distinct and well-marked species of Narcissus.

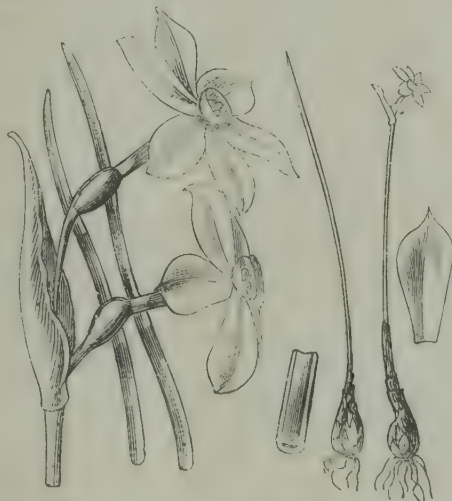
XIX. N. elegans of Spach is synonymous with Link's *autumnalis* and Boissier's *oxypetalus*. The bulb is roundish, about an inch in diameter; the leaves generally solitary, sometimes in pairs, developed, contemporaneous with the flowers, flattish and channelled above; scape, very slender, terete, about the same length as the leaves, carrying

Koch and Reichenbach, and is identical with the *N. angustifolius* of the *Botanical Magazine*. Its leaves are scarcely more than half the width of the typical plant, and besides being more slender are twisted; the divisions of the perianth are obovate, that is, wider towards the apex than the base, hence there is, in place of an overlapping a distinct radiation of the various divisions, whence the name. This plant grows abundantly in the Alps of Central Europe, and possesses a specific claim that we are almost loath to ignore.

and slightly incurved at the points; crown, little more than a projecting line, slightly divided into lobes; anthers, sessile, arrayed in a double series; the flowers are in all parts of a greenish-yellow colour, and possess the delicate perfume of the Jonquil. Though little known at the present day, this is no modern species, having been cultivated upwards of two centuries ago by Parkinson. It is a native of Morocco, the coast of Barbary, and also of the salt marshy flats between Gibraltar and San Roque on the northern coast. This plant is no doubt synonymous with the *Chloraster fissus* of Herbert,

two to five flowers; spathe, long, and wide-expanded; the tube of the perianth slender, of a greenish-white colour; the divisions pure white, almost linear-lanceolate, expanded horizontally; the crown, small, of a yellowish tint, almost entire as to the margin; anthers, nearly sessile, arranged in a double series. This species blooms in the month of September and October, and is a native of Italy, Sicily, and Algiers. It is not by any means a common plant in cultivation. I have only bloomed it once, and, were it not for its meagre foliage, it would be very effective, and fully realise the literal meaning of its specific title. It appears, like *Calathinus*, to have a considerable share of individuality as to the circumstances and conditions under which it will grow, and I have a strong suspicion that our climate is not at all adapted to those species of *Narcissus* that are found on the north African coast, nor is this to be wondered at when we consider how distinct are the climatic conditions of the two localities.

XX. *N. serotinus* of Linnæus is synonymous with *N. deficiens* of Herbert. This must not be confounded with the variety of *Bulbocodium*, to which the name *serotinum* was given, as our present plant is not only a distinct species, but a singularly anomalous one from the fact that its blooms are produced before the appearance of the leaves; hence the specific name *deficiens* of Herbert was by no means an inappropriate one. The bulbs are small, little more than $\frac{1}{2}$ inch in diameter, narrowing upward for a considerable length. The leaves are either solitary or in pairs, very narrow, and tapering to the point, convex below, and very slightly concave above, fistulose as to the lower portion, produced after the scape has died down. The scape is very slender, 9 to 12 inches high, terete, terminated by a large erect spathe, from which one



The Late-flowered Narcissus.

or, more rarely, two flowers are produced. The tube of the perianth is slender, the divisions are obovately lanceolate, and distinctly acuminate. The corona small, cup-shaped, with an almost entire margin; the stamens arranged in a double series near the mouth of the tube. The flowers, as in the last species, are white in all their parts. This plant is rarely seen in cultivation, although it appears to have a tolerably wide geographical range, as specimens occur in the herbaria from Spain, Greece, the Barbary States, and Palestine. It flowers late in the autumn, and the fact that the flowers are developed without any foliage must seriously detract from its beauty, although it adds unquestionably to its botanical interest.

XXI. *N. Brousonneti* of Lagasca.—So distinct is this plant from all other *Narcissi*, that in Gay's Herbarium it is recorded under the new generic title of *Aurelia Brousonneti*. Roemer, in his *Amaryllidacæ*, referred it to *Chloraster*, under the specific title *obliteratus*, evidently expressive of the total absence of the crown. This is a character of so much

real structural importance, that I am almost disposed to recognise its claims to a special generic title—the more so, as a glance at the accompanying figure shows that it bears, in the general campanulate character of the entire flower, a very close resemblance to the *Amaryllis*. Mr. Baker, however, retains it under the old genus; and I avail myself of his description, as given in his excellent "Monograph." He says:—"The bulb is ovoid, about the size of a hen's egg; leaves, about four to a scape, 4 to 6 lines broad, about as long as the scape; scape, about a foot high, four to eight-flowered;



Brousonnet's Narcissus.

pedicels, 6 to 8 lines long, shorter than the spathe; tube, 8 to 9 lines long, exclusive of the ovary, under a line thick, greenish at the base, white upwards; divisions of the limb, sub-campanulated, erect, patent, pure white, oblongly lanceolate, about half an inch long by a quarter of an inch broad, narrowed sud-

denly to a bluntish point; crown, almost entirely confluent with the apex of the tube; stamens, biseriate, the lower filaments $1\frac{1}{2}$ to 2 inches long, their anthers just reaching the top of the tube, the upper filaments, $2\frac{1}{2}$ to 3 inches long, reaching half-way up the divisions." I may observe that, in the above description, as compared with the figure, a slight discrepancy occurs in the length of the tube, that of the figure considerably exceeding Mr. Baker's description; and, further, that no mention is made of a very distinct character which markedly presents itself in the figure, in the gradual widening out of the tube upwards to the base of the divisions of the perianth. Mr. Baker states that the specimen in Gay's Herbarium at Kew, is the only one they possess, and that it is noted as gathered also at Mogador by Broussonet, a fact which is recorded in its specific title. Let us hope that some of our enthusiastic *Narcissi* collectors of the present day—such as our friend Mr. Barr—will succeed in introducing this extremely interesting species into general cultivation.

XXII. *N. canariensis* (The Canary Islands *Narcissus*).—This is, perhaps, the smallest-flowered and most slender species known, the name resting on a solitary specimen in the Kew Herbarium, collected in the Canary Islands. It is about 2 feet in height, the slender scape bearing from five to eight, or more, flowers. The latter are barely half an inch across, often only one-third of an inch, and of a pure white colour, except the anthers, which are deep orange-yellow; the perianth segments are ovate-acute, scarcely a third of an inch long, by $1\frac{1}{2}$ to 2 lines broad; the corona is very small, little more than a raised rim, the margins being nearly entire. This portion of the flower closely resembles the same part in *N. elegans* or *N. serotinus*. It is, undoubtedly, a small-flowered form of the Little-cupped *Narcissus* (*N. Tazetta*), and must be referred to the white-flowered or *N. papyraceus* group. Although far from being a showy plant, it is well worth culture, on account of its singularly graceful habit. It has never, so far as I am aware, been introduced to our gardens.

General Cultural Remarks.

In the preceding descriptions of the several species of *Narcissi* I have had occasion to allude, in exceptional instances, to certain cultural peculiarities, which have suggested themselves from the



The Canary Islands Narcissus.

conditions under which such species grow in their native habitats. In addition to these, I conceive that a few remarks on their general culture will not be out of place. With such I purpose concluding my somewhat lengthy article. Let us, then, by way of preliminary enquire under what conditions do we generally find them in Nature? I have already stated that many of the species frequently affect the margin of woods; others, again, those upland meadows in semi-alpine districts, that during the spring are saturated with moisture from the dissolving snow of a still higher altitude; and some are at home in the salt sandy districts that border on the shores north and south of the Mediterranean Sea; more especially do many of the most distinct species affect the north coast of Africa. Though at first sight these several conditions may appear very dissimilar, yet they possess in common one of the most important elements of successful culture. What, then, is this element? It consists of a maximum supply of moisture when the annual growth of foliage and flower takes place, and a minimum supply at the time when the bulbs are ripened off, by which means a period of perfect rest is secured. These are the all-important points upon which the successful culture of *Narcissi*, and, indeed, all bulbous plants depend. Let us analyse the three conditions before named, and see in how far each one of these conditions—although originating from different circumstances—compass the cultural axiom I have stated, and which is, my reader will admit, so far established as to come under that definite title. Those *Narcissi* that grow in woods enjoy during the winter season, when their giant neighbours, the trees, are leafless—a full and abundant supply of moisture; they are, indeed, then perfect masters of the situation, although pigmies when compared with their summer companions. On the other hand, often after they have completed their growth the active condition of the early-developed leaves of the trees is continually removing the moisture from the ground, and thus providing the elements of rest—namely, a complete dryness of the soil. This beneficial action of the trees is further supplemented by the continuous accumulation of humus or vegetable

arising from the annual fall of the leaves, so that they may be said to be not only the protectors but also the nourishers of their vernal companions. If we study for a moment the conditions of those I have described as at home in the sub-alpine meadows, raising their golden or pure white heads, as the case may be, above the green sward, we find more similarity than might at first have been supposed. Here, in spring, the melting snow from the upland regions percolates through the soil, and supplies abundant moisture for the active growth of these, and the whole family of charming spring flowers, with which they are, under such conditions, associated. As summer advances, and the direct rays of an uninterrupted sunshine impinge on the mountain sides, the moisture gradually evaporates, leaving scarcely sufficient to support life in the surrounding herbage, which is always greedy to devour such as may fall to its lot from the passing shower, leaving the bulbs of the Narcissi in a state of rest, ready to be again roused into activity when the autumn rains, coupled with the failing energies of general plant life, allow the ground once more to become fairly moistened. Again, as to those which affect the sandy shores or coast-line of Northern Africa, does not Nature, in her alternate rainy and dry season, prepare, after a more direct fashion, all the elements required? Here, doubtless, the hot arid winds that blow from the Lybian desert rapidly dry up every particle of moisture from the ground; and, under these conditions, the state of rest may be said to culminate. On this fact, coupled with the presence of certain saline matters which these sands doubtless contain, in all probability hinges the difficulty we experience in the culture of the group of highly interesting species that are met with in Northern Africa; added to which, the diminished temperature of our northern latitude renders it necessary that they shall be grown in pots, so as to protect them during the winter's frosts. And anyone who has attempted to grow even our own native Narcissi in pots through a series of years will soon find that, after the first year or two, they lose their vigour; and practice says it is only to be restored by consigning them again to Nature's bosom, under whose fostering care their failing strength will soon become re-established. We must, therefore, admit that our non-success is in all probability attributable rather to our non-appreciation of the conditions to which Nature has adapted them rather than to any inherent constitutional weakness that they possess. Having thus pointed out the analogy that exists between these circumstances, however diverse they may appear at first sight. Let me ask, do we take Nature for our guide in our ordinary garden culture? I fear the reply must be in the negative—at least more generally is this the case than otherwise. We will take the ordinary conditions under which collections of these plants are found, and the first thing we will probably find is, that they are grouped together in a bed or border by themselves. Now this, I admit, is highly desirable, as enabling a ready comparison of the several species or varieties one with another; but, in addition to this grouping, that law and order which is, I also admit, an essential in tidy gardening, demands that no weeds be permitted to invade their sacred allotment, and, consequently, the hoe and rake are in continuous requisition. Now, for a moment, compare this with Nature's treatment; she supplies them with abundant associates in the shape of the greensward or other forms of vegetation—that, full of active life during summer, take up the superabundant moisture; we carefully remove the same, and thus deprive our Narcissus bed of those elements essential to perfect and sustained rest; the result is that in this, as well, indeed, as in the infringement of any of Nature's laws, we gradually lower the constitutional vigour of the plants. Let, therefore, where they are thus isolated, a substitute be found for the weeds in the shape of Mignonette, associated with a few of our gaily-coloured annuals, and, further, let these be cleared off not later than the middle of September, a nice dressing of well-rotted leaf soil being applied and forked in, thus giving the soil time to absorb a fair share of heat from the autumn sun, and to be sweetened by the atmospheric influence. Where they are grown in a mixed border, usually speaking, they will find themselves in close proximity to some vigorous rooting plant, which will answer all the purposes required. The question may here be asked, why not lift the bulbs in early summer and replant in the autumn? Such is the practice with some growers, but I am loath to recommend it for two reasons: the first is, that such a process is foreign to the Book of Nature; the second is, that there is always a liability of lifting some too soon, and of neglecting to plant others until too late, as well as the difficulty of choosing the happy medium between dryness and dampness in the arrangements made for storing the bulbs away. All these things considered, I prefer leaving them to Nature—merely lifting and replanting them about every fourth or fifth year—and be sure that in doing so you anticipate the very earliest stage of root formation, as, if left, as it too frequently is, to November or December, you are sure to affect the bloom for the next

season. I ought to state that when this lifting process takes place, before replanting, the whole of the bed should be well-dressed with old manure, and thoroughly dug or trenched; if the latter, let the ground be moderately well trodden over to firm it, as the roots of all plants—and more especially of our Daffodils—like to fight their way against a pretty solid resistance; and, remember, that the popular notion of lightness in the texture of the soil being beneficial to root development does not always prove true. Amongst this class of Endogenous plants rarely do we find the roots inclined to branch; nay, I might go so far as to say they are devoid of the power of branching, and, as a result, when even the growing point becomes injured, the root not only ceases to elongate, but really ceases to be of any value towards the sustentation of the plant, as decay sets in and the entire root soon disappears. When, therefore, in removal, more than one-half of these delicate feeding processes are virtually destroyed—which is sure to be the case if they are developed even to the length of half an inch—it will not be at all surprising that the plants receive such a severe shock as to cause blind and imperfect flowers. Speaking of the flowers coming blind reminds me that this may originate from another source as well. The beautiful old-fashioned double Pheasant's-eye Narcissus, a favourite with every one, alike for its purity and its perfume, is one especially liable to this when it has been grown for many years in the same locality. This arises from sheer exhaustion of the soil, and may easily be guarded against by a winter's dressing of nice short rich manure, or by a few copious waterings with diluted liquid manure during the spring growth. The former I prefer, as it answers in the double capacity of protector and stimulant. The roots of all these plants are in a vigorously active state during the entire winter. Hence, it is advisable that they should have their stimulating dose early, and that it should be gentle and constant, not spasmodic. If the roots find not the nourishment in the ground, they will draw on the magazine stored in the bulb for the support of the leaves and bloom. And even after this appropriation the roots are unable, through very feebleness, to make good the loss when they are called upon to fulfil the more severe task. Admitting that, under special circumstances, this grouping arrangement must be carried out, I am far from considering it the one I would recommend for general adoption. There is no place where the Daffodil does better or looks more lovely than when springing from the Grass, there, if he nods his head beneath the weight of the accumulated moisture of a succession of spring showers, no taint of Mother Earth tarnishes his purity, nay, rather, he rises again with returning sunshine fresher and brighter for his bath. On our trim-kept lawns, where the very first growth of the green sward calls into existence the noisy rattle of the mowing-machine, groups of Narcissi are not, by any means, happy; but let us ramble beyond the precincts of culture and cast a glance at a group in the open field, or adjacent to some shrubbery where the scythe but once a year steps in to Nature's assistance, and what do we find? Why, what else but congruity and harmony? The leaves rise, green to the tip, from a mass of mingled Moss and Grass, interspersed with the bright brown foliage of the Beech or the paler Oak, whose various tints lend a contrast to the fresh glaucous hue of the Daffodils; but, besides adding to the beauty and harmony of the picture, these adjuncts, combined, have fulfilled the purpose of admirably protecting the buds in their early growth, and now combine to support the slender leaves against the mutilating influence of the wind, and, further, in the decay of the withered Grass and leaves below, are assisting to restore the elements of fertilisation to the soil. Far be it from me, however, to say that I would wish to banish so loveable a flower as the Narcissus from the precincts of the trim-kept garden. Rather let me show where the most fitting locations may be found for it. The margins of shrubberies are amongst these; there are always little indentations—natural irregularities arising from the difference in growth of adjacent shrubs—where the mowing-machine does not come; corners, we may say, still sacred to the scythe. In these, with admirable effect, may our groups of Narcissi be placed, where respect can be paid to their leafage, so that it be not cut over before it naturally fades away. Do not obtrude them on the lawn in scattered patches, where they but marr the quiet repose of the green sward. In the wild garden, whether it be a dell formed by Nature or by the hand of man, whether it be a rootery or a rockery, or a combination of all together our Narcissi will be found at home. There will be presented all the elements of successful culture, and there they will find happy associates in the wood Forget-me-nots, the variegated Dead Nettle, the Wall Cresses, the Aubrietias, and a host of similar plants, not to mention the bright moss-covered nooks and crannies rich in the verdant colour of their delicate tracery; here then may a collection of Narcissi be maintained in a natural condition, each sort grouped by itself, with an unobtrusive number, by which, on reference to your note book, the name and history of each variety may be obtained.

ASPECTS OF VEGETATION.

OLIVE TREES NEAR THE MEDITERRANEAN.

ALL who visit Nice, Mentone, and the Genoese Riviera, for the first time, are struck with the luxuriant aspect of the Olive groves in these districts compared with those in the more exposed parts of Italy, Spain, and the south of France. With the small proprietors of Olive groves situated along the sheltered shores of the Mediterranean, the Olive harvest is perhaps the busiest period of the year, not even excepting the time when the Orange and Lemon orchards are stripped of their golden fruit. Our illustration represents some of those old patriarchal Olive trees that may here and there be met with on the rocky outskirts of the more densely planted groves near the shore. In the south of France (says Dr. Bennett) the Olive tree, however fertile, is a miserable object. It is generally treated as a pollard, is small and dwarfish, and looks much like a mutilated dust-covered Willow. As soon, how-

longevity of the Olive tree, in a congenial climate like that of Mentone, may indeed be said to be indefinite. There are Olive trees still alive at Monaco, at the Cap Martin, and elsewhere, which are supposed to be coeval with the Roman Empire. It is a slow-growing tree, and forms cartloads of hard roots, which fill and cover the ground where it stands. When, after several hundred years, the trunk decays, the bark remains alive. As the decay progresses the tree splits, as it were, into two, three, or more sections. The bark twists and curls round each of these decayed sections, and unites on the other side. Then, instead of the old tree, we have, in its place, two, three, or more apparently separate, although, in reality, all growing from the same root. When these in turn die, new shoots spring up from the old roots, and thus the life of the tree is indefinitely prolonged. The old Olive groves are, from this cause, indescribably singular and interesting, presenting, on every side, evidences of hoary old age. All the stages of growth above described may be witnessed



Olive trees on the shores of the Mediterranean.

ever, as the Esterel Mountains are passed and Cannes is reached, we enter on a different climate, more protected in winter, and more suited to its growth. It is allowed to grow as a forest tree, and at once assumes a dignity and grandeur which quite surprises those who have only seen the stunted specimens of Provence. The Olive tree is only destroyed by a frost of 15° or 16° Fahr., so that it is not injured or killed on the Riviera by exceptional winters, as are the delicate Lemon trees. But the young shoots and the fruit are frozen and irremediably injured when the thermometer falls 6° or 7° below the freezing point. No frost, however, to which this region is exposed, even once in a century, can injure the tree, so that it goes on growing indefinitely, and attains its natural period of longevity, as do with us the trees that are natives of our country—the Birch, the Beech, the Scotch Fir, and the Oak. Like them, it resists the terrible cold of exceptional years, such as the years 1860-61, and re-appears in spring hale and vigorous, when whole armies of apparently naturalised foreigners have succumbed. The

within the space of a few yards; and the partially decayed, partially split, gnarled, twisted, curved trunks are picturesque in the extreme. The healthy full-grown Olive tree is really very beautiful. It is often as large as a fine old Oak, but with fewer limbs and a more sparse foliage. In the variety of the Olive tree generally cultivated on the Riviera, the terminal extremity of the branches hangs down, so as to give it the characteristic appearance of a Weeping Ash or Willow. The predominance of Olive groves gives a peculiar character to the Mentonian amphitheatre and to the Riviera in general. The Olive tree, which is a native of Asia Minor or of Palestine, is the tree of the Holy Land, and is constantly mentioned in Scripture. Thus its presence, as the principal feature of the surrounding vegetation, imparts an Eastern charm to the place. The branches of the Olive tree are not numerous; they spring from the trunk near the ground, or rather the trunk generally divides into two or three branches. The Olive berry ripens in the autumn, becomes black, and begins to fall off the tree in December and January.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

The Potato.—Since 1845, when the disease first broke out, the Potato has been the subject of more discussion than probably any other vegetable in cultivation, yet the practical results gained by such discussions have been infinitesimally small. There are, however, one or two cultural matters, which, if they do not directly prevent disease, at least tend to avert its worst effects. Foremost among these is a selection of such kinds as, from their early maturity, are ready to take up before the disease usually sets in; and next, and scarcely less important, is the preparation of the tubers for planting. Instead of allowing seed Potatoes to remain in clamps, or to lay thickly in heaps in a dark place until the time has arrived for putting them in the ground, soon after the commencement of the year, the earliest sorts should be placed in a single layer in shallow boxes in a place where they will receive sufficient light to cause the sprouts, which are then beginning to form, to grow stout and strong, and of such a nature as will, to great extent, reduce their liability to break off at planting time. This treatment prevents the weakening effects of the tubers forming long weak sprouts, that are certain to be destroyed in placing them in the ground, and it effects the all-important object of giving them at least three weeks' start in advance of such as are planted without any previous preparation. The best varieties for general cultivation are of Kidneys—Myatt's Ashleaf, Veitch's Improved Ashleaf, and Lee's Hammersmith Kidney. The last is early, a heavy cropper, and not surpassed in quality by any early Potato in existence. Of Round kinds—I would recommend Early Oxford, York Regent, and, for the latest, Paterson's Victoria. Any of the first-named Kidneys, and the above three Round varieties, are enough for all practical purposes, while in quality they are immeasurably before the soapy high-priced American sorts. The boxes used for placing the tubers in should not be above 6 inches deep, and enough dry straw should be at hand for protection in case of severe frost. The driest part of the vegetable-ground should be selected for Potatoes, and if the soil be light and poor, some manure should be wheeled on to it when the ground is frozen. This may consist of old hot-bed manure, in which a considerable amount of leaves has been used, or decayed vegetable matter from the refuse heap, which should have a place in or near every amateur's garden, and to which all vegetable tops, leaves, and Grass mowings should be conveyed, as also summer weeds that have not been allowed to grow until seed has been produced by them. In a well-managed garden they ought never to be allowed to stand until they have reached that condition, but, if such a stage has been reached, these, and weeds of a perennial character, prunings and hedge clippings, should all be charred (not burned), and the charcoal added to the refuse heap, which, if well and tidily managed, instead of being offensive to the eye, will become a valuable adjunct to the garden; the cultivator should, as far as possible, return to the soil all that it has produced, so as not to impair its fertility. If in a neighbourhood where lime can be had at moderate cost, a liberal addition of it to the refuse heap will greatly improve its quality, as well as destroy slugs and their eggs.

Peas.—When the ground is not frozen, and a dry moderately sheltered piece exists, a few early Peas, consisting of Sangster's No. 1 or William the 1st, should be sown. The latter is a very free cropper, and both are good for early work. They should be sown in rows 3 feet apart, in moderately rich soil. If at all poor, dig in some manure. The ground for the rows should be opened about 2 inches deep, but the seed should be covered with 4 inches of soil, consequently a slight ridge will be the result, which will assist in throwing off rain. If the ground is at all wet or retentive, Peas will be much benefited by the covering being composed of old potting soil or similar dry material. Scatter over the surface of the rows a sprinkling of fine coal-ashes, which will prevent slugs from infesting the soil, in which they frequently do early Peas serious mischief. These early crops should be sown considerably thicker than further on in the season, so as to make up for loss by birds and other enemies. The seed of these early sorts is much smaller than that of the late varieties; consequently it goes further in sowing—a quart will sow a row of about 10 yards. Where danger is apprehended from mice, an excellent plan is to get some Gorse, clip it with the garden shears to about an inch in length, and scatter it an inch thick over the seed in the rows before the soil is put over them; this also mitigates the effects of severe frost should such occur so as to penetrate the ground deeply before the seed has vegetated, and by which sometimes it is injured.

Seakale and Rhubarb.—If not already done, Seakale and Rhubarb roots should be put in for forcing. It is much more economical to take these roots up for forcing than to force them where they grow. Seakale will do well on a slight hot-bed made of leaves, which are not liable to get too hot. On such a bed place a

small frame, and put into it 6 or 8 inches of ordinary garden soil then put in the roots a couple of inches apart. Instead of the glazed light on the top of the frame, use a wooden shutter, over which place enough old mats or litter to completely exclude light. Rhubarb may be forced in the same way, but it will require a deeper box to allow its growing higher than the Seakale. Rhubarb and Seakale so forced will be found much better flavoured than such as is grown in a Mushroom-house, where a quantity of stable manure is fermenting, and which frequently imparts such a rank taste as to make it unfit to eat.

Glass Structures.—Indoors continual watchfulness will be required, as a few hours negligence may easily destroy the work of a season. When there is any appearance of frost it is safe practice to put on a little fire sufficiently early in the evening to get some heat into the pipes in good time. This, amongst ordinary green-house plants, will be rather beneficial than otherwise, provided the temperature does not rise above 45°, which should be about the heat maintained in such a structure through the night; to be thus prepared is much better and more economical in the way of fuel than hurrying on fire late in the night, when extremes of insufficient or overheating are too often the result. Should frost continue, be careful that the plants are not placed too near the pipes, or they will get their roots dried by the heat; this is a matter of frequent occurrence where open trellis-work shelves exist over the pipes, even if at considerable distance from them, the heat in its upright course rushing right to the plants, unduly exciting growth, and having a most unnatural influence upon the roots. Cinerarias and Calceolarias, more than most things, cannot bear being placed in such a situation; a low pit, if such exist, is the best for these plants, where they can stand on a bed of coal ashes, with a hot-water pipe round it to exclude frost; if a place of this description is at hand, they will make satisfactory progress, and maintain their large bottom leaves in a healthy state. Cinerarias are most useful winter-flowering subjects, but do not well bear heat to bring them on, nor is it necessary; for, if the seeds were sown in proper time, so as to get the plants sufficiently forward, they will come in without using a higher temperature than indicated for the general stock. The deliciously-scented *Daphne indica* should find a place in every amateur's collection, keeping it during the winter at the warmest end of the house, but now, as always, being careful not to over-water it on account of the aversion this plant has to being too wet at the roots. If a few plants of the useful, hardy, white-flowering shrub, *Deutzia gracilis*, are placed at the warmest end of the house they will come on gradually into flower, and be very useful either as decorative subjects or for cut flowers. A few pot Roses may also be similarly treated, but, before they are brought in, see that they are quite free from insects. The continuous flowering Cyclamens are indispensable for winter-blooming; they should be well supplied with water, if they are allowed to suffer for want of it they will not succeed; keep them near the glass, if on a shelf not far from the roof all the better. If, in the amateur's garden, there is a house devoted to Vine culture, and the crop is all cleared, the sooner the Vines are pruned the better, as nothing is gained by deferring the operation; close pruning to a single eye makes the neatest work, but in the amateur's Vinery it will be safer to leave a couple of eyes to each spur; after they are pruned they should at once be painted over with the usual dressing, composed of clay, with a little sulphur, soot, and soft-soap or Gishurst compound, mixed with water, so as to form a thick paint, with which they should be coated all over—previous to which the loose outside bark should be stripped off, but only such as is loose, not scraping them to the extent sometimes practised, and which does serious injury (no doubt with the intention of removing the eggs of red spider or thrips), and is as unnatural as anything that could be imagined. After they are finished they may be tied across the front of the house, especially if young Vines that have not fully occupied the space they are intended to fill, in which case they will require their points keeping tied low down to induce them to break back; if old Vines they may be tied up in their places.

GARDENING FOR THE WEEK.

Trees and Shrubs.

THE present wintry weather will have put a stop to all planting; but advantage should be taken of it to prepare stakes for steadying and supporting any plants that have been recently transplanted, or may require such assistance. Such a lull in active operations will afford time for maturing plans, preparing lists of plants wanted, and for getting ready suitable labels, &c., so that planting may be pushed on the moment a favourable change in the weather takes place. The labour set free from planting may now be profitably employed in trenching and preparing large holes, if the ground has not become

too frost-bound. The snow will, in a great measure, have prevented this; but care should be taken to clear this off the surface before opening the trench, for, if buried in the soil, it is a long time thawing, and considerably reduces its temperature. In severe weather, in the absence of snow as a protector, a load or two of straw-rubbish should be kept at hand to throw over the surface of the ground to be trenched, as it will prevent frost penetrating, and the work of trenching can then be carried on without interruption. In trenching, great care should be taken not to allow any vegetable matter that is not decomposed to become mixed up with the soil, as it is sure to generate Fungus. If it be intended to break up and reform old plantations, all the *débris* should be carefully raked from the surface before disturbing the soil, for, if buried, it is sure to injure the health of the plant. Leaves and dead sticks are generally harmless so long as they lie on the surface, as they absorb and retain too much moisture in this position for Fungus to generate; it is only when buried and moderately dry that the conditions are favourable for its formation. On the surface of the soil the fallen leaves of most plants are a positive benefit, as they gradually decompose, and convey to the soil fresh material for the roots to feed on. Besides the manurial matter they carry back, they are invaluable as conservators of moisture, as they form an excellent mulching, and effectually prevent the escape of moisture. It must be a dry time indeed, if moisture cannot be found under even a slight layer of leaves. Nature does not allow even a fallen leaf or a blade of dead Grass to be lost. Each has its new productive functions to perform; and, finally, in their decay, form food for the nourishment of fresh organisms. At this late season it is better to defer planting all kinds of evergreen till April, unless the plants to be removed are of small size, and are to be transferred to very sheltered situations. The last few mild winters have induced many to continue planting evergreens much too late, and if this has been the case this season, the chances are that many will be killed, for there is every prospect now of a severe season, and the turn of the year will most likely usher in even colder weather. All recently transplanted stuff should, therefore, receive a heavy mulching, so as to prevent the ground about the roots from becoming frozen. In planting very large deciduous trees, the stems and main branches should be bound up, either with bands of hay or Moss, but the latter is preferable, as it is neater and more retentive of moisture. If the trees are to be planted in exposed situations, this protection will be found of the greatest assistance in keeping the bark plump till root action takes place. Many large trees are lost after removal through neglect of this, as the bark becomes dry and contracted, thus closing the channels that should be kept open for the free circulation of sap. If this contraction of bark is allowed to take place, it is one of the greatest checks a tree can receive, and the growth is never so free or satisfactory as would have been the case if the bark had been kept fresh and plump. The necessity for this extra labour will depend much on the size of the tree to be operated on, and the character of the situation it is intended it should occupy, but if large, or at all valuable, it is better to give a little time and attention to this than to run any risk of failure. Plants of questionable hardiness should at once receive protection by shaking a quantity of dry leaves round their base. These should be afterwards covered with Laurel branches or Brakes, to prevent them being blown away. Numbers of shrubs and plants, that would otherwise be killed or greatly injured, will stand severe winters if protected in this way. Take advantage of the first favourable change in the weather to push on the planting of all kinds of deciduous trees and shrubs, for if frost again sets in, it may throw this work too far into the new year. If any trees are received from the nurseries during frosty weather, they should be placed in a close damp shed till a thaw takes place, a measure that will be found much better than exposing them by attempting to plant, or lay in. For ornamental planting, few deciduous trees excel the *Taxodium distichum*, as it is always beautiful, from the first opening of the bud to the fall of the leaf. Its light, elegant, pale green foliage equals in beauty many of the Fern fronds, and might be used to great advantage in lieu of them for dressing out flowers. In the autumn nothing can surpass the warmth of colour the foliage of this tree assumes, and even at this late season the trees are not yet bare. For rich autumnal leaf colouring, the Liquidamber is one of the most striking, and should have a place in every shrubbery, where, associated with variegated Hollies, &c., it will show off its lovely hues of rich colouring most effectually. The different varieties of *Rhus* are invaluable for the foreground, especially the lovely *R. Cotinus*, with its richly-coloured silky plumes, and *laciniata*, which makes an effective plant for the sub-tropical garden. *Ampelopsis japonica* is another desirable plant on account of its richly coloured leaves, and *A. Veitchii* is valuable for covering walls. If planted alternately with white variegated Ivy, the effect is most pleasing, as the Ivy forms a very pretty

setting for the red leaves of the *Ampelopsis*.—J. SHEPPARD, *Wolverstone Park*.

The Flower Garden and Pleasure Grounds.

While the ground remains covered with snow, or in a frost-bound condition, little can, of course, be done in these departments, unless it be the pushing forward, as much as possible, such operations as involve the removal of soil or the wheeling of gravel, compost, and manure; and this can generally be performed more expeditiously during hard frost than when the surface of the soil is soft. Where it is intended to remove overgrown or superfluous trees from the lawns or elsewhere, this may be done during such weather as we are experiencing at the present time. Shrubberies may also be thinned out by the removal of unnecessary plants, but the pruning of the remaining specimens, particularly that of evergreens, should be deferred until March. And when the weather is such as to stop the progress of all operations in the open air, attend to the preparation of stakes, labels, and Birch besoms, &c., all of which will be found useful as the season advances. Many bulbs and hardy herbaceous plants cultivated in the open border disappear altogether during winter, and their crowns are not infrequently injured by being trampled upon, unless they are all distinctly labelled; but where this is not considered necessary, a stout oak peg should be fixed in the centre of each group or patch of bulbs or herbaceous plants of any kind which disappears, and this peg should stand some 4 or 5 inches above the surface of the soil, and will serve to indicate the whereabouts of the plants, and prevent them being injured when the borders are dug or pointed over early in spring. Hardy annuals in pots intended to be planted out early, with the view of producing an early display, should have, for the present, the protection of a pit or frame, and are not unlikely to be injured by slugs or snails, to prevent which they should be frequently examined and occasionally dusted with quick-lime, if found to be necessary. Protect also such winter-flowering plants as the *Chimonanthus fragrans*, *Jasminum nudiflorum*, and the Christmas Rose, which will now be in full bloom if protected by a frame or a hand-glass. Continue carefully to protect bedding plants of all sorts from frost, and, whenever the state of the weather will permit, give abundance of air to dry up damp, &c.; but, at the same time, avoid placing the plants in a cold draught, and do not give water until they are really dry, when enough should be given to thoroughly moisten the soil.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Orchids.

Keep the temperature of the Orchid-house as equable as possible. *Angræcums*, *Dendrobium moniliforme*, and the different varieties of *Calanthe*, more especially the latter, will now be in fine bloom, and the flowers must be carefully treated, so as not to allow them to get wet, or they spot. This is one of the most valuable plants for providing autumn flowers, and possesses the advantage of associating well with any others, and lasting well when cut, if attended to in the matter of water. Do not allow the plants to shrivel too much for want of water, more especially *Vandas* of the *suavis* and *tricolor* sections, or they will lose their under leaves, which, in addition to injuring the plants, destroys their appearance. Keep *Cœlogyne cristata* at the end of the house, where there is most moisture in the atmosphere, and supply it sufficiently with water at the roots. Do not, however, allow any to fall on the advancing flower-spikes, as they are impatient of stagnant moisture. A temperature of from 50° to 55° at night will be enough for Mexican plants. Of these place such as are coming into flower at the warmest end of the house. They will include *Cypripedium insigne* and *venustum* and the varieties of *barbatum*, *Lælia anceps* and *autumnalis*, *Zygopetalums*, and some *Oncidiums*. These will be found invaluable for cutting at a season when flowers are most acceptable. In fact many of these old-fashioned winter-flowering Orchids do not receive the attention they deserve, but have been thrust aside for novelties possessing much less merit. Sponge over all the plants, so as to keep the foliage clean, and remove scale and other insects, which can only be kept under by continuous attention.—B.

Indoor Fruit Department.

In starting Vines, the chief point to be kept in view is a moderately strong bottom-heat to stimulate the roots into action. To ensure this, therefore, form new beds of fermenting material both inside and out on the top of the roots of Vines newly started; make these beds of sufficient thickness to raise and retain a heat of 90°. The inside bed will greatly assist in keeping up the temperature to 55°, which is quite high enough for the first week or two. When a portion of the fermenting material is turned over daily, it gives off a nice soft moisture, which is very beneficial to the Vines during hard firing. Cover the outside bed with glass sashes or boards, to keep out wet and wind, thus economising the heat. Add fresh linings to

outside beds made up a month or two ago, should they need such attention. The root temperature must, on no account, be allowed to decrease at this stage of growth, or a severe check will be the result. The fermenting material may now be removed from the inside of houses which were started in October or on the 1st of November. Tie in the young shoots as they require support; any which have grown in an upright manner should only be brought at first half way into their proper positions, but at the second tying with strong matting, bring them into their right places. Those who propagate Vines in pots put in the eyes about this time. Select the eyes from the best ripened prunings preserved for that purpose, cut the wood straight through directly above the eye, leaving about $1\frac{1}{2}$ inch of it underneath the eye, cut off slantingly, and make an incision opposite the eye, and the operation is complete. Three-inch pots should now be prepared for their reception; these should be dry and quite clean. A few small crocks should be put in for drainage, and the rest of the space should be filled up with good loam. A hole should then be made in the centre of the soil, and filled with silver sand, and the eye should be firmly pressed into position with the hand until the notch made opposite the eye is covered. This will leave the eye only above the soil into which roots will be pushed from the notch. The whole should be gently watered, and then set in some cool spot, from which frost is excluded, for a month before being placed in heat.

Pines.—Another batch of Queen Pines should now be replunged and given increased heat. It will be some time before the bottom-heat gets fully up after plunging them, so that although the Pines first plunged are in a bottom-heat of 90° , those plunged now will be somewhat inured to the increased warmth before the heat has risen to that height about them. The plunging material should be made sufficiently firm to stand up to the rims of the pots until the fruit is ripe. If not previously done, every plant should be thoroughly watered with manure-water immediately the fruit is visible. Smooth Cayenne, Black Jamaica, and Charlotte Rothschild, are the best winter kinds; and, where winter fruit is desired, these kinds should be grown in quantities. Where too many are ripe at once, if the fruits are cut and laid in an air-tight box, they will keep perfectly well for six weeks. Boxes, lined with zinc, are made for this purpose, and should be about every place, as they are useful for preserving other kinds of fruit. When Pines are cut, the old stumps, to which suckers are attached, should be allowed, if possible, to remain where they are for a couple of months, as the present is a very unfavourable time for the propagation of such stock.—J. MUIR.

Hardy Fruit.

This is the very best season for the planting of all kinds of hardy fruit, and, if weather permits, the sooner it is done the better, but on no account attempt to plant when the ground is in a sodden condition. Do not plant too deeply—if a young fruit tree does not thrive, I always trace the cause to deep planting; as a rule, they should never be planted deeper than they originally were in the nursery. After planting, mulch with either rotten dung or litter. This mulching is of the greatest importance, for, in the first place, it protects the roots from drying winds and frost; and, secondly, it manures the ground. The pruning of Apples, Pears, Plums, and Cherries should be done as opportunity offers; and, in the case of strong growers, it may be necessary to root-prune to get them into a fruitful condition, which operation is best performed by entirely lifting and replanting trees of a manageable size, and in the case of larger ones, digging out a trench a reasonable distance from their stems, and gradually working round them, taking care to cut the tap roots especially. For the benefit of those readers who may be intending to plant fruit trees, I give a list of the best half-dozen kinds of Apples:—Blenheim Orange, Wellington, Alfriston, Ribston Pippin, Cox's Orange Pippin, and Cellini; of Pears, Marie Louise, Duchess d'Angoulême, Josephine de Malines, Winter Nelis, Gansel's Bergamot, and Glou Morceau; of Plums, Jefferson, Green Gage, Golden Drop, Orleans, Belgian Purple, and Victoria; of Cherries, May Duke, Late Duke, Bigareau Napoleon, Governor Wood, Black Heart, and Morello. I recommend delay in pruning Gooseberries and Currants, as, frequently, the birds make such havoc of them when the buds first begin to swell and immediately after severe weather, that it is better to wait till food is more plentiful for the birds than lose the entire crop by early pruning. Strawberry beds that were trimmed and dug in the autumn ought now, if not previously done, to be well manured, leaving the dung on the surface of the ground as a protection to the plants. Draining, levelling, soil carting, and otherwise preparing ground intended for fruit trees, may be done when the ground is not in a fit state for planting, and advantage should thus be taken to forward all operations of this nature in anticipation of the busy time approaching.—W. WILDSMITH, *Heckfield, Hants.*

Kitchen Garden.

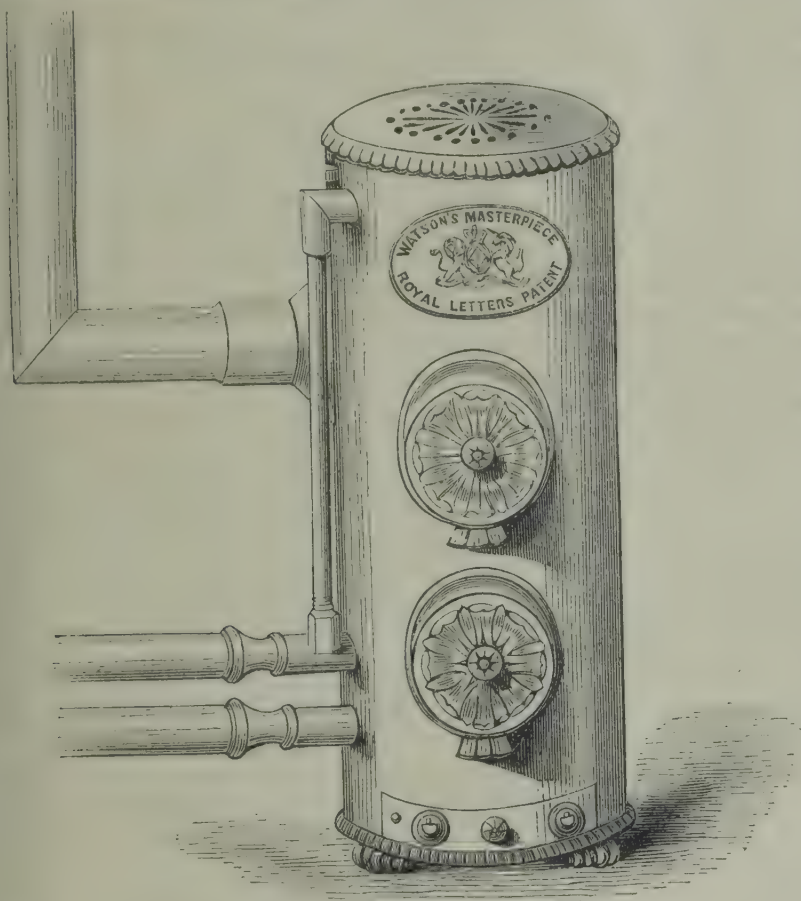
The seedsmen's catalogues, now coming in, remind one that the sooner all seed-orders are made out and sent in the better; and upon this subject I should like to say a few words. In the first place, it does not pay to buy cheap seeds. Inferior seeds have more to do with the production of inferior crops than is generally supposed. The seeds from one grower may be equal in germinating power to those of another, and yet, from the absence of care in selection, they will produce an inferior crop. Breed always tells in seeds, in fact, in anything, and it is impossible for a seed-grower who takes pains in selecting his stock to sell as cheaply as the one who does not trouble himself about the matter, and whose only criterion of quality is their germinating power. In ordering the seeds for the coming year, as a rule, reliance should principally be placed upon old well-tried varieties; at the same time, in order to keep pace with the times, a few of the novelties annually introduced, may be tried. I do not attach very much importance to high-sounding testimonials; and one thing is certain, a good many of the new or so-called improved kinds of vegetables are not heard of after the first year or two, which would not be the case if they were endowed with all the good qualities vouched for by their sponsors. It may be said that gardeners, in their selection of the occupants of the kitchen garden are very conservative, and I admit there may be some truth in the statement. Fashion has not yet laid her encroaching hand upon the vegetable department, except it may be to line the central walk with flowers; but I never yet knew a gardener, however old-fashioned in his ideas, who would not gladly avail himself of any really improved variety of vegetable; but when a man has been deceived a few times he becomes suspicious, and waits for a new introduction to be thoroughly tested by others before he commits himself. The wealthy amateur is the seedman's best customer for novelties, and fortunately that numerous and enthusiastic class is being constantly reinforced. Take advantage of the present wintry weather to finish wheeling the manure to uncropped land; place it in large heaps in the centre of the plots, to avoid loss from the drying influence of the atmosphere, and do not level it down till just before the land is in a fit condition for digging. Prepare fresh stable manure and leaves for making hot-beds by thoroughly shaking and mixing the material together. Where leaves cannot be readily obtained, it will be a very great advantage in making hot-beds if cow or pig-manure can be had to mix with the stable-manure. Horse-manure is hot and fiery, and the addition to it of about one-third, or even a fourth, of its bulk from the cow-shed or pig-stye—which is of a cooler nature—will cause the heat to be more steady and permanent. Where hot-beds are depended on for the first early Cucumbers, a bed large enough for a one-light frame should be put up now for raising the young plants, should no other means exist for bringing them forward. In cold situations, where it was not thought desirable to sow Peas in autumn in the open air, preparations should shortly be made for fetching up lost time, by sowing some under glass for planting out when the weather becomes more favourable. They may either be sown in 48-sized pots or in troughs, which any unskilled workman, who has a few rough boards, can put together, or they may be sown in fibry squares of turf, hollowed out in the centre. It is not advisable to start them in too high a temperature, as there is plenty of time without undue forcing. A frame placed on a bed of leaves, where they can be near the glass, will do well, or, if more convenient, they may be placed in any house where forcing has just commenced. Early Long-pod or Dwarf Cluster Beans may be sown rather thickly in boxes, and brought on gently and strongly under glass, to be planted out singly on a warm border when the weather is suitable. Early Potatoes for hot-bed planting may now be started in boxes or pots, according to the demand and conveniences for growing them.—E. HOBDAV.

Cottagers' Gardens.

Kitchen garden operations must now be regulated by the state of the weather, as the cultivation of land, especially when of a heavy character, or in a saturated or frozen condition, would be positively injurious, advantage should be taken of hard frosts for wheeling manure, soils, &c., to wherever they may be required. Prepare Pea sticks, stakes, labels, &c., during rough weather, in order that no delay may occur when the season for cropping has arrived. Fruit trees or bushes, infested with insects, should now be divested of Lichen and loose bark, and painted with Gishurst compound or other insect-destroying mixture. Mulch the roots of freshly-planted trees with rough litter. As regards flowers, Primulas and Cyclamens should now form conspicuous objects in windows, and a few of the earliest bulbs should be gradually brought forward to succeed them. Christmas Roses, now coming into bloom, will be benefited by receiving some slight protection from unfavourable weather, as their pure white blossoms are easily injured.—J. G.

WATSON'S PORTABLE BOILERS.

THESE are extremely useful contrivances, either for heating halls, libraries, small conservatories, or greenhouses. One of the greatest drawbacks to heating by means of stoves is the dryness which their use occasions; but in the stove of which the accompanying is an illustration especial provision is made to avoid this evil, the action of the fire being more than counterbalanced by the moisture given off by an evaporating pan placed above the water Jacket boiler. The hot water from the boiler escapes by a small flow-pipe, about an inch in diameter, into the pan above, and, as it cools, it descends again by a return pipe into the boiler, an arrangement by means of which a constant circulation is kept up. Thus all the advantages of hot-water heating are obtained on a small scale and at a minimum cost, both as regards the apparatus and the fuel consumed. There are two or three outlets and hot-water pipes can be attached if desirable, so as to distribute the heat more regularly in plant-houses; or these can be plugged, and the boiler then answers every purpose of an evaporating stove. The portability of the apparatus, the short time in which it can be fixed ready for work, and its moderate price recommend it to all who desire a heating apparatus of this kind. It would be useful in any establishment in case of accidents with the



Watson's Portable Boiler.

ordinary boilers and pipes, and as these generally occur when the greatest pressure is upon them, that is during sharp weather, serious damage is often done before they can be repaired.

Salt for Roads and Drives in Frosty Weather.—It is the practice on the North Metropolitan Tramway, and I have myself tried it on other roads with great success, to sprinkle rough salt upon the surface of the roads and in the grooves of the tramway whenever, through snow or frost, the roads became dangerous or difficult. The effect is that within twenty minutes of the application the snow or frost thaws, and horses travel over the roads without roughing and without difficulty. The cost of this process, compared with the loss usually sustained by accident, delay, and the cost of roughing horses, is not worth consideration. One ton of salt costs from 22s. to 29s.; it will, if judiciously applied, thaw about 2 miles of road, and will serve from two to three days of moderate frost. I am aware it is alleged that the salt destroys the adhesiveness of the road surface when a natural thaw comes, but I am also informed by practical men that the same effect upon the roads always follows from the break-up of frost; but, admitting that some slight damage is done, surely the immense advantage gained from the roads being kept open is more than an equivalent for any expense that such damage would entail.—A. G. CHURCH, Secretary, London General Omnibus Company, in *Times*.

THE FRUIT GARDEN.

GRAPE VINE TREATMENT AFTER PLANTING.

LEAVING the subject of temperature to be fully discussed when we come to describe the second year's treatment, which will embrace a complete season's growth, I may only remark here, that in the daily temperature, the maximum should be reckoned at noon and the minimum at sunrise, and go on to speak of newly planted Vines from eyes, which, in my last chapter, we left enjoying a night temperature of 65°, and 80° by day. These figures are only given as averages, however. Supposing the temperature of the Vinery to stand at 85° at mid-day, my practice would be to reduce air gradually and shut the house up to its maximum temperature about two o'clock p.m., sustaining it by fire heat if needful, and allowing it to subside gradually to 75° at dusk, to 65° about ten o'clock, and to 60° in the morning, or even to 55° in cold weather, rather than resort to hard firing. This practice is not troublesome; a little experience soon enables one to judge how much fire-heat is necessary to counterbalance the out-door temperature under all circumstances. As the Vines progress, and the days lengthen, the night and day temperatures should be raised by degrees until about June or July, when the minimum night temperature should not fall much below 70°, and the day temperature should be run up to 80° in dull weather, and to 85° or 90° with sun-heat; shutting up the house on such occasions 5° above these figures, but making some abatement for the night temperature at the same time if the nights are cold. For such varieties as the Muscat of Alexandria and Barbarossa a temperature 5° higher all over will be required. These temperatures should be maintained until the canes get brown and hard to their extremities, which will be towards August or September, according to circumstances. After this the temperature should decline at the ascending ratio, till fire-heat is discontinued and the house thrown open altogether.

Temperature of the Border.

If the border is heated by any of the means before described under the head of "Bottom-heat," the temperature should be maintained during the growing season at about the mean temperature of the Vinery at all stages; thus, supposing the minimum night temperature of the Vinery at starting time to be 40°, and the maximum day 75°, the mean would be 57°, omitting fractions. The mean, however, should not be exceeded; it is better to be under than above it. Where hot-water pipes are employed they should be used with the greatest caution, and air drains should be opened only during the warmest part of the day, and when the temperature is considerably above the temperature of the border. Borders under fermenting materials should always be tested by thermometer 18 inches below the surface of the soil, or where the roots are known to be, and, when the heat is too violent, treading the litter well with the feet will always lessen the fermentation quickly, while turning and mixing the materials, and, when necessary, adding to them, will increase the heat.

Airing.

Closely connected with temperature is the question of airing. Air, less or more, should be admitted to the Vinery at all times, except when the weather is so cold as to necessitate closed ventilators in order to maintain the required temperature. When hot air ventilators are employed, it will be easy to admit fresh air in the coldest weather, but these will not be sufficient on sunny days, and the ordinary back and front shutters will have to be worked. Beginning in the morning with the rising thermometer, all good practitioners make it a rule to admit air little by little, at both back and front, until the maximum amount is reached with the noonday temperature; after which the air is reduced by degrees, until the house will bear shutting up at or above the maximum temperature as before directed, but the ventilators should never be closed altogether; about a $\frac{1}{4}$ inch of air should be left on along the top and bottom. To make sure of this, when the Vineries are in charge of different individuals, I have a piece of thin lath tacked on temporarily under each shutter to prevent it closing entirely. Of course, the scale cannot be adjusted so nicely as is here supposed, but the principle indi-

cated should be held in view. Quick rises and falls of the temperature, or sudden gusts of air rushing in against the foliage, are evils that will surely tell upon the Vines in the long run. In warm weather, such as we sometimes experience in June and July, it is advisable to leave the ventilators wide open day and night. Shutting up should only be resorted to to economise sun-heat, but when the temperature can be kept up without such aid it is in every way better.

Damping.

This is a term generally used to denote a practice necessitated by the use of artificial heat; though at one time damping and steaming was carried to such an extreme in the culture of the Grape, that one might suppose it was absolutely essential, and that the Vine delighted in an atmosphere in a continual state of saturation; whereas, exactly the opposite is the case—a balmy, dry atmosphere, with abundance of moisture at the root, is probably the most favourable condition that could be conceived for the Vine; but under glass, and the influence of fire heat, an artificial state of aridity is produced, especially in sunny weather, which is very trying to the tender foliage of the Vine, and the only preventative is damping, in a discretionary way. For instance, most gardeners know how difficult it is to steer clear of danger on those occasions, when the pipes have been made hot in the prospect of a dull day, and the sun suddenly and unexpectedly shines out in a forenoon, accompanied, perhaps, with a cold, dry, shrivelling wind, which makes it dangerous to open the ventilators more than a few inches; while, on the other hand, danger is equally imminent from a too high temperature, unless air be given. In such a dilemma damping is the safeguard, for a liberal sprinkling of the inside borders and paths with water, which, quickly evaporates and loads the atmosphere with moisture, reduces the temperature and lessens the necessity of giving more air. For similar reasons, damping is also necessary when a Vinery is shut up at a high temperature in the afternoon. A moist atmosphere arrests the excessive perspiration from the foliage, which would otherwise take place in a high and dry temperature, resulting in what is usually called burning, or scorching, of the leaves. Damping, in fact, should always be resorted to in drouthy weather, especially if the leaves of the Vines are observed to be flagging under a bright sun, or to sustain the necessary degree of moisture in the air when hard firing is required. The evaporating troughs on the pipes may always be kept full, as they will only give off moisture according to the heat of the pipes, and consequently supplying the greatest quantity of moisture when it is most needed. Syringing the Vines should never be practised with a free circulation of air, but only when the house is closed, otherwise the effects will be destructive. As far as possible, soft water should be used for syringing. If the rain water from the Vineries is collected into tanks inside the Vinery, it will afford a supply for this purpose; and the slightly sooty character which water so collected always has will be no disadvantage to the Vines if the water is allowed to settle before using it; soot is disagreeable to the insects which infest the Vine. In dull weather, when little ventilation can be afforded, damping in any form should be avoided, as it only induces a watery growth and tender foliage, which flags before the first bright sunshine.

Watering.

Inside borders want a good deal of attention in watering when the Vines are growing, and it is chiefly a question of judgment. With young Vines, whose roots have not extended far into the border, each plant must be watered separately at first, and the whole border should be kept in a sweet and moist condition. The roots rapidly extend themselves, however, when the Vines have fairly started into growth; it is then better to deluge the border thoroughly with water at the temperature of the Vinery, whenever watering is supposed to be at all needful; it is hardly possible to overdo it in this respect when the border is well drained.

Training of the Permanent Vines.

Formerly it was the custom to stop young Vines after they had grown about half-way up the rafter, and to restrict their growth generally, from this period until the end of the season,

in the belief that a stronger cane was thereby secured; but more recent experience has shown conclusively that the contrary is the case—that the greater the amount of wood and foliage the Vines are allowed to carry, the greater their vigour will be—i.e., a Vine which is allowed to make a cane 20 feet long the first year, will be twice as strong as one that is allowed to make only 10 feet of growth. Consequently, it has become the practice with many noted Grape growers, to permit young Vines from eyes to develop both leaders and laterals to their fullest extent; and with one-year-old Vines to let nearly every bud which breaks grow to the top of the house—in fact, to ramble as much as they please; and at the end of the season, to cut the leading canes down to the bottom wire, and the others close back to the stem. The second year, the accumulated energy thus secured is directed into one or two rods only, and canes of great vigour are the result, and these are again cut down to within 2 or 3 feet of the previous year's cut, and so on, till the Vines have covered the roof. There can be no question whatever of the results of this system; but the advantages are more apparent than real, if early return is an object, and not merely sensational bunches at the end of four or five years. The explanation is simple. When this extreme extension system is followed no supernumeraries can be grown, for the permanent Vines occupy the whole of the space. For instance, I have seen a Vinery nearly 100 feet long and 20 feet wide, in which the Vines were trained in this way, and the whole roof, a perfect thicket of wood and foliage, affording a remarkable example of the growth and vigour which can be got up in a few months; but it was the fourth or fifth year before even a partial crop of fruit was secured, whereas such a house should have accommodated at least forty supernumeraries, not including the back wall, without interfering with a moderate but sufficient development of the permanent Vines; and, at the most moderate estimate, at least 400 lb. weight of Grapes should have been gathered the year after planting from the supernumeraries. For these reasons I practise and advocate a medium system of extension with young Vines. I train only one rod from each Vine, which is allowed to grow to the top of the house, when it is stopped, and the side laterals also are stopped at every joint. This single rod permits of sufficient development of wood and foliage to ensure as vigorous a cane as anyone can desire, without encroaching on the supernumeraries, whose welfare are just as important while they are wanted as the others. At the end of the season the canes are cut back to within 2 feet of the bottom wire if they are vigorous (weak growths should be cut down to the bottom again). This ends the treatment of the permanent Vines the first year.

Supernumerary Vines.

As these are only intended to remain till the permanent Vines come fairly into a bearing state, they must be treated with an eye to fruiting the year after planting, and for a few years following. The front row of plants which, it will be recollected, were planted between the permanent Vines, should be allowed to grow about 7 or 8 feet up the wires, and then stopped; the laterals also must be pinched regularly at every joint; the middle row will catch the wires at this point, and they must also be stopped when they have got nearly to the top of the rafters, and otherwise treated in the same manner. The little winter pruning required by these consists in simply cutting the laterals close back to the permanent buds—which should, at the end of the season, be hard and plump—and in shortening back each cane to within 6 feet or so of the point where they first catch the wires.

J. S.

(To be continued.)

ROOT-PRUNING PEACH TREES.

THERE often seems to be considerable difference of opinion as to the practice of root-pruning Peach trees, some asserting that there is no necessity to have recourse to the practice, provided young trees are properly planted in a border adapted to the requirements of the Peach, and every attention of course paid to the regulation of growth, the balance of sap in the tree, and all the necessary pinching and tying, as well as to the cropping of trees in time to prevent a too luxuriant growth. No doubt there are conditions of Peach

culture under which there is little necessity for root-pruning. But, unfortunately, it does not always happen that young trees have their wants supplied, as in the case here referred to. I have before my eyes a number of young trees which have been planted for some years, and yet have never borne anything beyond a chance sample of fruit now and then. The aspect—an east one—is not the best; the border was made of materials calculated to produce an immense quantity of roots, which, in their turn, sent forth vigorous spongy-green wood, to ramble at its pleasure all the summer, and to be cut out the following winter—and so on year after year. The material in which those trees were planted consisted of peaty soil, leaf mould, and rotten manure, the very thing to save one the trouble of gathering much fruit. In the month of June last, when those trees came under our charge, we commenced pruning, which was done at three different times. All strong fruitless wood was cut out, and only that which was likely to be of use encouraged. So diligent were we in the matter of regulating and pinching, that we shall never need to apply the knife in a single instance this winter. It was six weeks before we managed to get the border thoroughly drenched. The neglect, on this score, would account for the long pointed puny buds, which the trees made in previous years. Borders, composed of such light materials as I have named, require any amount of water, more especially in a case like ours, where the tree roots are all inside, and the house a lean-to with a sharp pitch. During the end of the summer the numbers of suckers which pushed up indicated something wrong below, and it was, therefore, decided to mend the old border or make a new one altogether, to root-prune and re-plant. The trees realised every expectation when we got to the bottom, and found the long knotty roots which no soil but leaf mould will produce; and, strange to say, the only two trees in the house which had any fruit whatever on them, were nearly overrun with Fungus. In fact, the whole border, when opened, smelt like a Mushroom-bed. In lifting the trees, care was taken to have a close house, and to dew the roots and tops with a fine syringe. I fancy when these roots get hold of a pure loam instead of leaf-mould, they will, if we may judge from appearances, repay us for our labour by a moderate crop next year. I wish, by these remarks, to convey to the minds of those who hesitate to try root-pruning, that, in my belief, it is the only effectual remedy in cases such as I have mentioned. Peach trees, that are twenty years old, will bear lifting if the operation be carefully carried out, and they are not subjected to very early forcing the following year. I had two large trees of Royal George lifted in the early Peach-house at Roby Hall, which were started to have ripe fruit by the 20th of May; the consequence was, that I gathered dozens of unusually large fruit, for that variety, from trees which, for three consecutive years, had not borne half-a-dozen Peaches each. The practice was also adopted in a late house with the same beneficial results, and so pleased is my successor, Mr. Lindsay, with the change for the better in the trees, that he has given them all a thorough overhaul, and now very wisely intends giving them a comparative rest, which will have the effect of invigorating the trees, and must eventually prove of much benefit.

W. HINDS.

Otterspool Gardens, Liverpool.

HYBRIDISATION OF THE MONUKKA AND BLACK HAMBURGH GRAPES.*

THE Black Monukka is a Grape believed to be of Indian origin, which was received from the late Mr. Johnson, gardener at Hampton Court, and distributed by the Royal Horticultural Society. It is a Grape of great peculiarity and of great excellence. It is of exceedingly robust growth, and a somewhat shy bearer. The bunches produced are, however, very large—from 12 to 20 inches or more in length, and of a regular tapering form. The berries are small, long-ovate, inclining to be conical like an Acorn, measuring $\frac{7}{8}$ inch in length and $\frac{5}{8}$ inch in diameter. In colour it approaches black when well ripened, but is more frequently of a dull reddish-brown; it has a thin coating of bloom. The skin is thin, adhering to the pulp, which is firm, fleshy, and not melting, yet very tender and full of juice. It contains no perfect seeds, only one—or at most two—half-formed, and these being soft like the pulp are eaten with it, as well as the skins. The flavour is rich and sweet, of the most agreeable character, not in any way peculiar, yet refreshing and pleasant to the palate. The Black Monukka is termed a seedless Grape. It is so, however, only so far as the seeds remain immature. The seeds are formed, yet from some cause they are not perfected. This failing may perhaps in some measure account for the smallness of the berry. The peculiarity may possibly be due to defective setting. Were the seeds perfected

and fully-grown, as in other Grapes, the berries would perhaps be larger. Whether this is so or not, however, to alter its peculiar character in this respect would certainly not improve it. There is something very novel and quite pleasing in eating Grapes without being troubled with either skins or seeds. With the view of being able to introduce some of the desirable qualities of the Black Monukka into our most approved sorts, or of raising a good large-berried Grape of a seedless character, such as a seedless Black Hamburgh, it was proposed to try the effect of hybridisation. The necessary and proper precautions being taken to ensure success, a few flowers each of the Black Hamburgh, Muscat of Alexandria, and Royal Muscadine were fertilised successfully with pollen from the Black Monukka. Unfortunately, in thinning the Grapes the few fertilised berries of the two latter were cut off and so lost. But from the Black Hamburgh some twenty-five seeds were secured. The reverse of all these crosses was tried also, viz., using the Black Monukka as the female, but without success. Several half-formed seeds were secured from the Black Monukka, more fully-developed than in their usual normal condition, but they refused to vegetate. From the twenty-five seeds of the cross between the Black Monukka as the male and the Black Hamburgh as the female, twenty-two plants have been raised, fifteen of which have fruited. The first noticeable fact is the foliage. The leaves and shoots of the whole set more closely resemble that of the male parent than the female. The leaves are all deeply lobed and sharply serrated, like the Black Monukka, the leaf-stalks red and hairy, as well as the young shoots. The plants bear no resemblance whatever to the Black Hamburgh; by the foliage they would be grouped as four distinct varieties. In the fruit they are widely different of the fifteen which have fruited; eight of them have the berries white, and five have the berries black; six have long or ovate berries, and seven have the berries round, part of each being black and part white. Three are very early, and two are very late, and, with one exception, they are all small. Two of them have small berries, resembling the Black Hamburgh (female parent), with the leaves of the Black Monukka; one resembles the Black Monukka in the shape and appearance of the berries, but it is a coarse late Grape. Two of them have proved seedless, like the Black Monukka; but the berries are round, and the one white the other black. In no case is there an exact reproduction of either the male or the female parent, the majority of the results being decidedly inferior to either. A few have peculiarities which entitle them to further trial, but the greater part are quite useless.

Best way of Furnishing Walls with Pear Trees.—

“Enquirer” would probably find Pear trees trained cordon fashion, either vertical or oblique, produce fruit sooner than any others that he could fasten to his wall. It would, I think, be a bad use to make of a south wall to plant pyramids in front of it. I have not tried cordons, but I have obtained a speedy and abundant return from trees on the Quince stock, trained to a west wall, in the form of a five-tined fork without its handle, and set upright with the points upwards. Such trees can be had from most nurserymen who are fruit-tree growers. The sorts that have done best with me, so trained, are Louise Bonne, Beurré d’Aremberg, Passe Colmar, Beurré Diel, Beurré d’Amanlis, Soldat d’Espérin, and Doyenné Boussoch. These, when I got them, were maidens on the Quince stock, some from the Chilwell nurseries near Nottingham, and some from Sawbridgeworth. A Glou Morceau on Quince roots, planted at the same time and trained in the same way, took a longer time than the others to arrive at a bearing state; and although the tree looked healthy, and now produces an average crop, the first Pears that appeared were neither large nor good. A standard Glou Morceau on the Pear stock, planted here about five and twenty years ago, attained a large size before it yielded fruit. It has lately produced heavy crops. If I had a south wall, and wished to cover it with Pear trees, I should plant at the required distances trees trained in the form of Verrier’s Palmette, with flat standards or riders between each, to give fruit for a few years, to be reduced gradually, and finally to be removed when the Palmettes had completed their growth.—B. S. [Mr. Tillery advises our correspondent to add to his list of Pear trees Josephine de Malines. At Welbeck this variety is unequalled as regards its rich aromatic flavour, and it generally keeps well from February to May. Planting Pyramid Pear trees in the way mentioned on purpose to get a crop the second year would, he has no doubt, be successful, but the trees would look out of place so close to the wall. It would be better to plant the wall with diagonally-trained Cordon Pear trees on the Quince stock, which, by summer pinching, would yield a good crop the second or third year. They might be planted as close together as 16 or 18 inches, and would produce larger and finer fruit, and a better crop than could be obtained by any other system of training.]

* By A. F. Barron, in *The Journal of the Royal Horticultural Society*.

THE KITCHEN GARDEN.

BROAD BEANS.

THE following is Mr. Barron's report on Broad Beans grown at Chiswick in 1874, as given in the "Journal of the Royal Horticultural Society:"—

The collection, composed of about fifty packets (a great portion being duplicates), was sown on March 6, in very deeply-trenched fresh soil, in lines 3 feet apart. Notwithstanding the dry season, the Beans continued to grow well, and kept free from blights. The trial was in all respects a satisfactory one. The committee awarded two first-class certificates, and reduced the number of varieties to twenty. A further trial is necessary to test their hardiness during winter. For this purpose the seed should be sown in the month of November. The following is a list of the donors:—Messrs. James Carter & Co., Holborn; Mr. J. Douglas, Loxford Hall; Messrs. J. Hardy, Bures, Essex; Minier, Nash, & Nash; Nutting & Sons, Veitch & Sons; MM. Vilmorin, Paris; Messrs. Waite, Burnell, & Co.

1. **Long-pod, Early Long-pod.**—Plant of a very free habit of growth; branching at the ground, with from three to five stems, about 2 feet 6 inches high. Pods, 7 inches long, with three to five medium-sized Beans. Ripe seed, dull fawn colour. Prolific. A general good cropper, and of good quality. Early.

2. **Hang-down Long-pod, Matchless Long-pod, Monarch Long-pod, Feve de Marais grosse Ordinaire.**—A somewhat larger and more prolific variety of the Long-pod, having the full-grown pods much inclined downwards. Ripe seed, dull fawn.

3. **Carter's Mammoth Long-pod.**—A very superior variety of the Long-pod, with very large long pods. First-class certificate.

4. **Green Long-pod.**—Differing from the ordinary Long-pod by the colour of the Beans, which are, when fit for use, bright green. Pods, from 4 to 5 inches long, mostly erect, containing from three to four Beans. Ripe Seed, dull green.

5. **Feve Julienne.**—Plant, robust, 2 feet 6 inches high. Pods, about 4 inches long, narrow, containing about three small Beans. Ripe seed, small, dull grey. Worthless.

6. **Feve Julienne Verte.**—A green-seeded variety of the preceding. Comes into use two days later than Long-pod.

7. **Mazagan, Early Mazagan, Hative de Mazagan.**—Plant, vigorous, with three to five stems, 3 feet 9 inches high. Pods, produced abundantly, erect or upright, 4 inches long, with three to four small Beans. Comes into use five days later than Long-pod, and is the latest of all.

8. **Hardy's Pedigree Windsor.**—Plant of robust growth, 2 feet 6 inches high. Pods, produced abundantly, generally curved downwards like the Long-pods, from 5 to 6 inches long, with three large broad Beans. This seems to be an intermediate variety between the Long-pods and Broad Windsor Beans, and will probably be found to be the Old Toker Bean. An excellent sort.

9. **Windsor, Broad Windsor, Improved Broad Windsor, Westbury Prize, Taylor's Windsor.**—Plant, of full and robust growth, branched. Pods, produced abundantly, much curved downwards, 4 to 6 inches long, about 1½ inch broad at the lower end, with two to three very large broad Beans. Ripe seed, large, dull fawn colour. This is a much-esteemed sort, and of most excellent quality.

10. **Thick Windsor.**—This is distinct from the preceding, in having thicker seed in a ripe state.

11. **Harlington Windsor, Loxford Windsor, Broad Windsor (Veitch).**—This is a well-selected and somewhat improved form of the Broad Windsor, producing rather larger pods.

12. **Green Windsor.**—This is distinguished from the Broad Windsor by having the seeds green. It is, on this account, greatly preferred by some. Ripe seed, large, dull green.

13. **Seville Long-pod, Feve de Seville (Vilmorin).**—Plant, moderately robust, 2 feet high; does not branch so much as other sorts. Pods, very long, 7 to 8 inches, rather sparingly produced, with about six Beans of about the same size as the Long-pods; they hang down so much as almost to rest on the ground. Ripe seed, large, dull fawn colour. This is the earliest and longest-podded of all the Broad Beans. Is fit to gather three days before the Long-pods, and eight days before the Mazagan. It is of good quality. First-class certificate.

14. **Feve Violette grosse.**—Plant of robust growth. Pods 6 inches long, with three to four fair-sized Beans. It is fit for use three days later than the Long-pod, the young Beans being of a pale red colour. Excellent quality. Ripe seed rather long, of a dull violet colour.

15. **White Blossom.**—Plant robust, 2 feet 9 inches high. Blossom white. Pods 4 inches long, with three fair-sized Beans. Ripe seed small black. This is five days later than the Long-pod. A moderate bearer.

16. **Red Blossom.**—Plant robust, with three to five stems, 2 feet 6 inches high. Blossom deep dark red, with black lip; extremely ornamental. Pods 4 inches long, with three fair-sized Beans. Ripe seed is spotted dingy brown. Fit to gather same time as Long-pod. It is much subject to sport, the colour of the flowers varying from deep red to pale dingy brown and nearly black. A moderate bearer.

17. **Feve tres naine Rouge.**—Plant robust, branching much, about 12 inches high. Blossom of the ordinary character. Pods 4 inches long with three small Beans. When fit for use tinged red. Comes into use the same time as the Long-pod. The ripe seed small, dingy red. An inferior sort. Moderate cropper.

18. **White Fan, Royal Dwarf Fan.**—Plant robust, much branched, 18 inches high. A most profuse bearer. Pods produced in erect clusters from the surface of the ground, from 3 to 4 inches long, with about four fair-sized Beans. Ripe seed small, dingy fawn colour. Fit for use two days after Long-pod. A very excellent variety and good quality.

19. **Beck's Dwarf Green Gem.**—Plant robust, but particularly neat and compact; much branched, 1 foot high. Pods small, produced in erect cluster, abundant, about 3 inches long, with three small Beans of a fine green colour. Ripe seed small, green. Fit for use one day after Long-pod. A most desirable variety to cultivate, the crop secured from these dwarf Beans being quite equal to that from the tall forms.

20. **Naine Hative.**—A very inferior form of the preceding.

LIST OF THE BEST VEGETABLES.

Brussels Sprouts.—Strymger's Giant and Roseberry.

Beet.—Henderson's Pine-apple, Dell's Crimson, and Waterloo.

Beans.—Dwarf Cluster, Early Longpod, Green Windsor, and Taylor's Broad Windsor.—French: Osborn's Forcing, Newington Wonder, Canadian Wonder, and Negro Long-pod.—Scarlet Runners and Eclipse.

Kale.—Cottager's and Green Curled or Scotch.

Broccoli.—Snow's Winter, Cooling's Matchless, Miller's Dwarf, Knight's Protecting, Chappel's Cream, and Cattel's Eclipse.

Cauliflowers.—Early London, Veitch's Autumn Giant, and Walcheren.

Celery.—Ivery's Pink, Sandringham White, Williams's Matchless Red, and Incomparable White.

Cabbage.—Enfield Market, Cocoa Nut, Atkins's Matchless, and Red Dutch.

Savoy.—Dwarf Green and Early Ulm.

Carrots.—French Horn, James's Intermediate, and Altrincham.

Cucumbers.—Telegraph and Wood's Improved Ridge.

Endive.—Green Curled and Batavian.

Cos Lettuce.—Dummick's White Victoria, Bath (black-seeded), London White, and Incomparable.

Cabbage Lettuce.—Tom Thumb, All the Year Round, Neapolitan, and Hammersmith.

Leeks.—Musselburgh and Ayton Castle Giant.

Melons.—Gilbert's Victory of Bath and Shah of Persia. The latter is a scarlet-fleshed variety, raised by Mr. Gilbert, and sent out last season. It is of medium size; and, as regards flavour, first-rate.

Onions.—White Spanish, Brown Globe, James' Keeping; and for autumn sowing, White Lisbon, White Tripoli, and Giant Rocco.

Peas.—Ringleader or First-crop, William the First, Dickson's First and Best; Huntingdonian, an improved Champion of England, sent out some years ago; McLean's Best of All, G. F. Wilson, Ne Plu Ultra, and British Queen.

Radish.—French Breakfast, an Olive-shaped variety, good for all seasons; Wood's Early Frame; Black Spanish, for autumn sowing; White and Red Turnip.

Parsnips.—Hollow-crowned and Student.

Tomato.—Trophy and Earley's Defiance.

Spinach.—Round for summer, and Prickly for winter.

Turnip.—Strap-leaved Stone, very early; Red American Stone; Orange Jelly and Chirk Castle Black Stone, for standing the winter.

Vegetable Marrow.—Moore's Vegetable Cream, and Long White.

Capsicums.—Long Red, Long Yellow, and Red Chili.

Cress.—Plain and Curled.

Mustard.—White.

Garnishing Plants.—Parsley: Myatt's Curled; Variegated Kale, and Curled-leaved Mallow.

Herbs and Sundries.—Chervil, Basil, Savory, Marjoram, Thyme, Cardoon, Rampion, Salsafy, Scorzonera, Seakale, Asparagus, and Chicory.

Of course, many other excellent varieties might be added to the above list, but those I have enumerated are all good, and may be obtained anywhere at reasonable prices.

E. HOBDAV.

King Koffee Savoy.—Like Mr. Gilbert, I had a packet of this new dwarf Savoy sent me by Mr. Harrison, of Leicester, to prove for him. I had a quantity of it planted in a plot by the side of Tom Thumb Savoy, and found that it was nearly as dwarf as that variety, and that it had larger heads. Since the frost has set in I have had some of it boiled, and find it to be excellent in flavour, the taste being something like that of Brussels Sprouts. Owing to its growing so near the ground and taking up so little room in the rows, it is a variety that I can highly recommend both for hardiness and general excellence.

—WILLIAM TILBERRY, *W. Elbeck.*

THE GARDEN IN THE HOUSE.

DISEASES IN ROOM PLANTS.

THE normal deep green colour of the leaves in plants is a sign of good health, but a yellowish or whitish tinge, instead of the usual shade, is a sure sign of disease. Unsuitable soil, stagnant moisture, insufficient nutriment, and too much or too little light, all induce this change of colour. In its early stages this disease can be easily cured by the removal of the causes which produce it. When the first signs of discoloration are observed (and they appear first on the leaves of the youngest shoots), the plant should be taken out of the pot in order to examine the condition of the roots. If these are all healthy and fill the balls well, then the cause must be looked for in an insufficient supply of food, or it may be that the plant receives too much or too little light. Want of food may be remedied by shifting the plant into a larger pot, by growing it in richer soil, or by watering with liquid manure. Plants accustomed to grow under the influence of full sunshine produce leaves of the deepest green; while the same plants, if grown in a shady position, generally have leaves of a lighter colour, becoming almost whitish in comparative darkness. On the other hand, plants which naturally grow in shady places, such as Ferns and Selaginellas, if removed into bright sunshine, will have the lively green of their leaves changed into a yellowish hue. Even underwood shrubs often lose their lively green in full sunshine, and plants grown in pots are more liable to suffer in this respect than strong specimens grown in the open air, which are better able to withstand the full force of the sun. Whether too much or too little light be the cause of discoloration in foliage, it can be easily remedied by shifting the position of the plant. If, when a plant is taken out of the pot, the ball is not well filled with roots, and if the young roots have not a fresh healthy appearance, then the discoloration will have been produced by unsuitable soil, or by an excess of moisture. In this case, the first thing to be observed, when the ball is not well filled with roots, is to water cautiously, and to see that the drainage outlet is not choked up, and, if no new roots have pushed into the soil around the ball, the soil must be changed at once. When the soil is suitable and free, and the drainage good, pot-plants do not so easily suffer from excessive watering, but when this is not the case, even in a slight degree, discoloration is almost sure to ensue. Therefore, when the leaves begin to turn yellow in plants which have made but few new roots in the ball, the drainage must be looked after, and the saucer, if any, under the pot removed, or the water, at least, poured out of it after each watering. The plants should, also, not be watered before it is ascertained that the ball is perfectly dry. There are many plants which thrive in almost any soil, and others which, when placed in unsuitable soils, never send out a single young root beyond the old ball. Of the latter kind are Camellias, Rhododendrons, and Epacris. Transplanting into proper soil is, in this case, the only means of restoring the leaves to their natural green colour. If, in the cases in which unsuitable soil, bad drainage, or excessive watering is the source of discoloration, the cause be not removed in time, then follows the second stage of the disease, in which the soil becomes sour, the young roots rot, and the leaves of the young shoots turn yellow. The remedy then is to cut away all the decayed parts of the roots, to transplant into freer and richer soil, to have perfect drainage, to water cautiously, and to give the plants a good position, favourable to their growth, or, if the disease has not very much advanced, it will sometimes suffice to provide good drainage, and to water sparingly with tepid water. By the discoloration of the leaves, the functions of receiving and assimilating nutriment are disturbed; therefore a minimum supply of food should be given until fresh roots have been formed, and the leaves have recovered their normal colour. Watering with warm water, after the drainage has been looked to, tends to remove from the soil the hurtful sourness which has been produced through the stoppage of the drainage outlet, and, in cases where the disease has not made much progress, will be of service, by restoring the soil to a proper condition of sweetness. But, when the disease has already made

great progress, the plant must be taken up, and all affected roots cut back to the sound wood. In still worse cases, the soil of the ball must be shaken out entirely, the roots cut back, and the plant re-planted with some powdered charcoal or sand round the roots, and, outside of this, some loose soil. Rich soil should not be given until the plant has recovered. Discoloration is sometimes also the result of low temperature. The leaves of Orange trees, for instance, often turn yellow in summer, when continuous wet weather or cold winds prevail. It is chiefly, however, plants from warm latitudes, which suffer from this cause, and the remedy consists in removing them to a warmer and more favourable position. Decay of the roots may, likewise, sometimes occur in consequence of too great dryness. Plants, which are kept too dry during their season of growth, soon lose both leaves and young shoots. The loss of the former re-acts on the young roots, and they also perish. Disease may also often be produced by injudicious watering, such as at one time giving so little that the lower part of the ball is not moistened, and at others giving so much that the ball gets saturated. The general falling-off of the leaves, which precedes the season of rest in deciduous plants is a well-known and natural phenomenon, and, after it occurs, the plants require a lower temperature and less water for some months than they have hitherto had. Many evergreen plants grown in rooms, however, often shed their leaves in quantities. This is usually the consequence of the plants being placed in a position at a distance from light, or it may follow from the effects of a dry atmosphere acting upon plants just brought in from a warm moist plant-stove. A well-lighted position, careful watering, and, later on, cutting back the plants to the last year's wood, are the means to be used in order to effect a cure. Plants sometimes die off suddenly in consequence of the partial decay of the stem immediately above the roots, while the roots themselves, shoots, and leaves, remain quite fresh-looking and healthy. This is produced by watering plants which stand in the full sunshine and which have both pot and ball then very much heated. The sudden lowering of the temperature and the absorption of a considerable quantity of water by the plant produce a stagnation of sap where the roots join the stem. The upper part of the plant is thus starved. Tender evergreen plants, especially Heaths, are liable to this disease, which should be guarded against by ceasing to water when the pots are heated by the sun. The pots, however, should be screened from bright sunshine. Rotting of the crown also follows when plants, which have become dry when sent from great distances in summer, are placed with their balls in water, or are watered too copiously, and suddenly brought from a condition of extreme dryness into one of extreme humidity. The proper treatment of such plants should be to place them in the shade, and to water them sparingly at first, gradually increasing the supply of water as they recover from their dried-up condition. Mildew is a disease which is apt to appear on Roses when forced. It spreads in the form of a number of minute white threads over the leaves and buds of the young shoots, spoiling the appearance of the plants, and producing a partial or total loss of the leaves. The white thread-like mycelium always appears at first in the shape of globules, which afterwards spread. In many cases they continue in what is termed the oïdium state without developing into the second form of fungus. This is almost always so in the case of the Rose-fungus, which should not be allowed to spread, but should be extirpated on its first appearance. When the first traces of it are seen on a plant, they should be carefully washed off and the whole plant should be sprinkled with warm water in which some flowers of sulphur have been stirred up, or the leaves should be well dusted with the sulphur when wet, and after it has been on them for a day or two it should be washed off. M.

Limekiln Heating.—Mr. John Cowan is not quite correct in stating that the system of limekiln heating used by him has nothing in common with that originally invented by me; for his, like mine, consists of a boiler heated by a limekiln. They certainly differ strikingly in detail; but Mr. Cowan errs with regard to the chimney. I never stated anywhere that I did not use one, and, in point of fact, I had one attached to my first kiln years before his invention was patented.—ALEX. COLLES, *Mill Mount, Kilkenny.*

Should Hot-water Pipes be Full or Three-parts Full?

—In heating conservatories and churches by means of hot water, should the pipes be full or only three-parts full, in order to allow the water to swell? My particular case is that of a church, which I wish to warm effectually. We have one of Sugden's independent conical boilers, 4 feet high, 15 inches in diameter, with one cross tube, and about 260 feet of 4-inch piping. The boiler is placed about 3 feet below the floor, and at the two highest points we have small taps to let off the air. The supply-cistern is about 16 feet above the pipes; but the chimney has no draught. Will the pipes work best full or three-parts full?—PETER SETTLE, *Whitehaven*. [The pipes should be kept quite full, otherwise the water will not circulate properly. You can easily ascertain if your pipes are full; for, in that case, the water will overflow at your air-taps. The supply-cistern should be kept about half-full, as about half the depth of an 18-inch cistern will be ample space to allow for the swelling of the water in your apparatus. Of course, the water should not be allowed to boil, but only kept hot. If your pipes dip under any doorways or passages, and rise up again on the other side, that will tend to impede the circulation of the water. The want of draught in the chimney may possibly be caused by its being choked with soot, especially if there are any bends in it. As it is impossible to say exactly what is wrong in such a case as yours without inspection, we would advise you to have the apparatus examined by a competent hot-water engineer. The boiler you mention ought to heat the amount of piping named; but we cannot say whether the piping is sufficient to heat the church or not without being made acquainted with its size.]

Periodical Flow of Sap in Trees.—Baranetzky, of the Observatory at Kieff, has investigated the periodicity of the bleeding of certain plants and its cause. Hofmeister was the first who recognised that this phenomena was one very widely observed among forest trees, and the daily and annual periods of this flow of sap have been examined into by several persons. Among the newer results arrived at by Baranetzky, it may be mentioned that he has been able to show that the daily variations of temperature had but little to do with the flow of sap, the latter being as decided in trees protected from temperature variations, by being inclosed in the hot-houses of the botanical gardens, as in the trees of the open air. The variations are perfectly regular, attaining their maxima and minima on the same day and at the same hours, and seem to him to indicate that the influence of temperature on the periodicity of the bleeding is, at least by certain plants, not direct and immediate, but of such a nature that it at first becomes manifest some time after the action of that which causes it. By introducing an artificial temperature variation, this idea was brought to a severe test, and it was shown that the temperature had really but little to do with the flow of sap, although it would be hasty to conclude that it had no influence whatever. It is only in the case of great temperature variations (for instance, a change of 20° Fahr.), that the normal rate of flow of sap is sensibly disturbed.

Fertilising Aucubas.—In your number for the 5th of December you have remarks (p. 525) on this subject. They seem to apply, however, to small or pot plants. Having more than a dozen large female plants about my grounds, I procured three years ago a male plant with plain green leaves. This I planted near a large spotted female, and when both were in flower, though the male was going off, I struck the male flowers against the females, and succeeded in getting a fair quantity of fruit, not only on the one plant, but on several others similarly treated. Next year I followed the same plan—the male having grown and produced more blossom—with the same success; but I had the pleasure of seeing many branches out of my reach bearing fruit, and of course naturally fertilised. Last spring I left the female plant first mentioned quite alone, and the consequence is a splendid crop of fruit in bunches from a dozen downwards; but, besides this, two other large plants in a line with it, probably 30 and 60 feet from the male plant on the side next to it, have fruit set in the same way. The inference is that leaving Nature to herself is the best plan, and that the pollen will do its duty at a considerable distance. When using the male flower artificially I throw the flowers I have been using into the middle of the plant, and I have put fresh flowers into a bottle and suspended them in the tree. Of course I have raised young plants, but am saved that trouble by self-sown ones, of which I have one or two, and expect to see an abundance next year. I do not consider the flowers insignificant, but very pretty.—G. B., *Bath*.

Rat-proof Wire Fences.—In the description given of these fences, at p. 596, the upright bars are reported to be an inch apart; permit us to state that they should not be more than half an inch apart, the former mesh being sufficiently large to let a good-sized rat through. We have made large quantities of fencing of the closer mesh, which fully bear out all that is stated as to their being perfectly rat-proof.—J. J. THOMAS & Co., 362, *Edgware Road*.

NOTES AND QUESTIONS.

[THE following notes and questions came to hand, or were answered, too late for insertion in their several departments.]

Onion Seed for an Acre.—Can anyone tell me how much seed is required to sow an acre of Onions for pickling? What would be the average produce? What soil is best? And what would be the cost?—STREATHAM.

New Type of Pelargonium.—In the remarks on this subject, translated from the *Revue Horticole* and published in our columns last week (see p. 581), for Mr. Charles Haller, of Nice, read Mr. Charles Huber, a correction for which we are indebted to Mr. Jean Sisley, of Lyons, the writer of the article in question.

Schizostylis coccinea.—I can endorse all your correspondent has said (see p. 539) in favour of this plant; here it was in bloom till the 7th of last month, when the rain and frost spoiled the remainder of the blossoms. Not only is it useful for outdoor display, but, when grown in pots, it is of great service in the embellishment of the conservatory. I ought also to add that, as a cut flower, it will keep perfectly in water for some days.—J. C., *Tyenham*.

Wintering Alocasias.—What do you consider the best way of treating Alocasias in winter? Are they to be dried off like Caladiums, or kept moderately moist? I should like to know particularly about Lowii, metallica, zebrina, and macrorhiza.—AN AMATEUR. [Winter your Alocasias in a warm plant-stove, keeping them rather drier at the root than when growing. The kinds you name are evergreen, and must not be dried off like A. Marshallii, A. Jenningsii, and other deciduous species.]

Fittonia argyroneura an Edging for Shelves.—For concealing the bare edges of stone shelves this plant is extremely useful. I have seen it grown in many places, but I never saw it cultivated in such perfection as it is in the plant stoves at Drumlanrig. There it is grown in nothing but half an inch of gravel, which is placed upon the shelves to set the pots on, and so luxuriant is its development that it hangs down 2 feet below the top of the shelves, and forms a rich and beautiful screen of silver-veined foliage.—J. MUIR.

Aucuba japonica dicecia.—In Mr. Maurice Young's catalogue, under the head of "New Aucubas," I see announced a variety, "Dicecia, having male and female on the same plant." I know not whether this is merely a grafted form or whether it is a true variety, but it is undoubtedly incorrectly named. The common Aucuba is dicecious, that is, has the two sexes on distinct individuals; plants with the male and female on one plant, but in separate blossoms, are termed monœcious, and monœcia would, no doubt, be a suitable name for Mr. Young's variety.—G. S. BOULGER.

Grapes Travelling without Packing Material.—In reference to this subject, allow me to say that, last autumn, I sent several hampers of Grapes packed as is described in your last number, from Jersey to Scotland. The sorts sent were Black Hamburg, Lady Downe's Seedling, and Golden Champion; this last, I was afraid, would not travel safely, as both the bunches and berries were large—in fact, they looked as if the less they were moved the better; but they arrived at their destination in good condition. The entire quantity sent, I was informed, had travelled better than any hitherto sent carefully packed in tissue paper, which was wrapped round each bunch, the interstices being filled in between with cotton wadding.—R. P. B.

Winter-flowering Orchids.—The following Orchids are now in bloom in the Victoria Nursery, Holloway, viz.:—Lycaste Skinneri and lanipes; Masdevallia ignea and Veitchii; Maxillaria venusta, nigrescens, and picta; Odonoglossum Andersonianum, Bluntii, cordatum, grande and rubescens; Oncidium cucullatum and tigrinum; Phalænopsis amabilis, grandiflora and rosea; Anæctochilus ordianus; a new Burlingtonia; Cymbidium Mastersii; Cattleya superba splendens; Calanthe Turnerii, Veitchii, vestita lutea-oculata and V. rubra-oculata; Cypridium insigne, javanicum and Roezlii; Dendrobium McCarthiae; Epidendrum prismatocarpum, vitellinum, and dichromum; Lælia autumnalis and anceps superba; Saccolabium giganteum; Stanhopea tigrina; Vanda tricolor Dodgsonii, flava, and insignis; and Zygotum Mackaili.

The Stockwell Green Building Agitation.—Within the past ten days or so the question with respect to building upon Stockwell Green has assumed an entirely new phase; it now appears that the demand made for the land, by the alleged freeholder—originally £4,000, next £8,000, and now finally said to be £12,000—has led to Chancery proceedings, which may ultimately result in establishing the fact that Mr. Abbott, who sold the ground to Mr. Honey for building purposes, had, after all, no legal right to do so, and, if so, that Mr. Honey's title is consequently bad. Should this eventually turn out to be the true state of affairs, the despoiling of the Green, which has been in progress during the last few weeks, may prove a serious matter for those responsible for it. It appears that the work of dismantling going forward at the early part of last week caused such an amount of irritation amongst the inhabitants as to have almost led to a breach of the peace. This was during the cutting down and removal of two of the finest trees on the Green, and the clearing away of a considerable portion of the turf. The other day the case came before the Master of the Rolls, on an application for an injunction in the suit of "Hammerton v. Honey," when the Master of the Rolls, upon an *ex parte* statement, granted an *interim* injunction restraining the defendant, the lord of the manor, from building upon or enclosing the Green. The effect of this judicial order is, that the Green must not further be disturbed until the case is legally argued on both sides, which will not take place before the middle of this month.

OBITUARY.

WE have to record, with much regret, the death of Mr. Charles Norval Thompson, son of the late Mr. Robert Thompson, for many years superintendent of the Royal Horticultural Society's Gardens, at Chiswick, at the early age of forty. For fourteen years he was sub-editor of one of our oldest horticultural journals; his genial disposition and unobtrusive manners, while in that capacity, gained for him many friends, and few enemies. He leaves a widow and four children indifferently provided for.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

TRANSPLANTING OLD FRUIT TREES.

HAVING seen many remarks lately on the transplanting of trees, and the effects of mulching and other treatment in promoting success, and in improving the health of the subjects operated upon, the following account of an experiment, on a somewhat extensive scale, which I made a few years ago with aged fruit trees will, perhaps, be interesting, as showing what may be accomplished in this direction with good prospects of success. It is often desirable to remove old fruit trees on an estate, but the fear of failure as frequently prevents the operation being carried out—more especially if the trees in question are favourites or are in a fruitful condition. Old orchard trees will bear root-pruning of a severe kind when they happen to be growing in a strong deep soil, and are making more wood than is desirable, as they sometimes do in late districts, but, when they are removed altogether, the check they receive is very great, particularly if the trees have never been transplanted before; hence they require special treatment. In the winter of 1867, I had to re-arrange a large number of fruit trees. About forty of these were above thirty years of age, and had not been disturbed at the root during that period. They were in a rampant and unfruitful condition; the sub-soil under them was deep and moist, and into this the roots had penetrated. I began transferring the trees to their new quarters in November, without much hope of success, as I found it would be impossible to get any feeding roots away with them. They had penetrated far into the stiff loam, and within a radius of 5 feet from the stem scarcely a fibre was found—nothing but long bare roots that had to be chopped off at the above length, as following them to their extremities was simply out of the question. I, however, "lipped" the roots every 9 inches or so to induce fresh rootlets, and transplanted them with as much care as possible, though none could be moved with a ball of soil, as the roots had no holding power. By January they were all transplanted and mulched thickly as a protection against winter frost or summer drought, and but for this precaution I believe not one of the trees would have been alive at the present time. The year 1868 was excessively hot and dry, as most of us will remember. It was particularly so in this district, and aggravated in our particular case by an empty reservoir; the trees, therefore, received little or no watering, but depended on the mulching alone, which just enabled them to retain their vitality, and nothing more. With the exception of some half-dozen or so of the number, not a tree moved a bud perceptibly, and they remained leafless and bare from November, 1867, till the spring of 1869, thus actually losing a year of their existence. Their forlorn appearance attracted much attention, and many predicted the demise of the whole; still, though the bark on the branches shrank visibly, sections of the buds showed that vitality was still present, and we did not despair. The few trees that pushed out leaves, which they did feebly about June, all perished; the little foliage they made evidently exhausting the last remnant of vitality. The following year, however, all the trees were clothed luxuriantly with foliage, and for some years after many of them bore better crops than they had ever done before. Numbers of the same trees have since been again moved to an orchard, and are now growing vigorously. It is not often, I believe, that deciduous trees remain dormant a whole summer after moving, and eventually survive; but that they will do so is a fact beyond doubt, and that, as I have shown, under very adverse circumstances. Possibly few evergreens would survive under similar circumstances; but I can state that the Holly will. Some years ago I had to lift some large trees in June. Owing to the stony nature of the soil, only poor balls could be got with the roots; and, though they were well watered during the season, no leaves were put forth, nor did the buds appear to move. The second year after planting they made but the scantiest foliage, though they flowered freely along the leafless twigs, but bore no fruit. These trees are

now in excellent health. The importance of mulching thickly all newly-transplanted trees cannot be over-estimated. Stirring the soil during the summer has been recommended as being quite as beneficial as mulching; but this I cannot admit. Let anyone try the experiment of mulching a row of Raspberries, and stirring the soil only about another row, and note the result. They will assuredly find out that in one instance they have given their labour for nothing. We all know that to keep the ground well stirred among growing crops is a good practice in drouthy seasons, but where a mulching of short Grass can be applied, it is infinitely better, as plenty of gardeners know who have to contend with dry soils. Stirring the soil merely lessens evaporation from the surface of the ground, but mulching prevents it almost entirely. Under the thinnest layer of short litter or Grass, the surface of the soil will always be found sweet and moist. One marked effect of mulching is, that it coaxes the roots of both trees and vegetables to the surface, where they evidently derive considerable nourishment from the dressing, but this is never the case where stirring the soil is alone resorted to. For this reason, mulching is injurious to Potatoes, for it causes them to push their roots up to the surface, and to form their tubers there, where, as the mulching decays, they get greened, and are, of course, useless. It is well known, also, how a thick mulching encourages Vine roots to the surface of the border. Indeed, no amount of top-dressing and stirring will ever accomplish the same result so quickly and so successfully. In some places, where excessive neatness is required, mulching is objected to, and the hoe used instead, and with what result? I have seen such borders so cracked and rent during summer that you might have inserted a walking stick into the fissures in many places. This cracking is more apt to occur in fruit-tree borders than anywhere else, for, as a rule, they are not dug frequently like the vegetable quarters, and being hard and firm, get rent in all directions, like baked clay. These fissures present an increased surface to the action of the air, and evaporation goes on, both above and below ground, so to speak, and the result is red spider, and other evils, in an aggravated form.

J. S. W.

ON PRUNING THE REDWOOD.

(*TAXODIUM SEMPERVIRENS.*)

THE *Taxodium* or *Sequoia sempervirens*, as it is frequently called, was first discovered on the north-west coast of America by Mr. Menzies, in the year 1796, but was not introduced into cultivation in Great Britain till about the year 1843. Notwithstanding the length of time it has been in this country, it does not seem to have attained that place in public estimation which it justly deserves, probably owing to most of the young plants sent out from nursery establishments being cutting-made, and, therefore, not possessing at first that upright habit and general symmetrical appearance which ought to be peculiar to seedling plants. The *Taxodium* is perfectly hardy, and cutting-made plants, if properly attended to with regard to early and, for a time, an occasional pruning, will ultimately make excellent and well-formed trees. Care, however, must be taken of them till such time as they begin to assume a true upright habit. Many cutting-made plants often take on double heads; the weaker one must always be removed, and this can be done with safety at any time of its growth. This tree appears to stand any amount of cutting with impunity, and at all ages; indeed, the more pruning they receive the better for giving them a pyramidal shape. It is most essential for the after-growth of the leader that all the top side-shoots should be pointed; if not, they spread out rapidly, and are apt to disfigure a tree, particularly after the lower ones have been operated on. I have pruned them of all sizes, from 1 to 20 feet, and I never knew a specimen in the least degree injured by it. In many places the unpruned branches are often seen dead at the points during the spring months. It is a very beautiful evergreen tree, and well suited for lawn or avenue culture. After pruning it will be found that the twigs produced are very numerous, and usually assume a pendent and graceful appearance. Any amount of cuttings may be annually taken from one tree without disfiguring it; yet, notwithstanding

its free-growing propensity, it is but rarely seen in collections, and, when observed, appears a wide-spreading bush, and is anything but pleasing to look at. Comparatively few seeds, in a state fit for germination, seem to have come to this country, as I never had the good fortune to raise more than three or four, all other specimens under my care being cutting-made plants. In some establishments seedlings have been raised, but are often outgrown by plants struck from cuttings. The *Taxodium* succeeds well, both in high and low situations, and in all soils where free pruning has been tried; it also thrives in woods, where it is generally allowed to ramble about, and is often uncared for. A few plants were much injured here during the ever memorable winter of 1860-61; this, I consider, was owing to the weight of snow at that time bending down their unpruned branches, and exposing the ruptured vessels to the severe frost which at the time prevailed, the mercury falling to 5° below zero. The same kind of injury happened to many of the unpruned *Deodars* that winter, most of the branches being spreading, and the plants chiefly in a shrub-growing condition. I feel satisfied that many of the larger unpruned specimens, if well cut in during the months of September and October, and even later, will, on account of the pyramidal shape thus given them, be able to resist snow with more success than can possibly be expected of unpruned specimens. I have also pruned them during the spring months, and never experienced any bad results. The *Taxodium* is more frequently to be met with in England than in Scotland, and some now seen in sheltered situations have attained a considerable size; the generality of them, however, would be the better for a judicious pruning. It is a noble tree in its own country, and its timber, which is called Red Wood, is highly recommended for many purposes. The bark of the *Taxodium* is very like that of the *Wellingtonia gigantea*; it is of a thick brown cushion-looking substance. This peculiar bark is chiefly confined to the stem, as I have not observed it on the branches of any of the plants. Large seedling plants of *Taxodium*, although possessing rather short leading shoots, have, very generally, wide-spreading branches, giving the trees a somewhat hemispherical appearance. Some known to me, although of the same age as many cutting-made plants, which have been regularly branch-pointed from their infancy, are now scarcely two-thirds of their height; whereas some of the original seedlings, which have been regularly branch-pruned and pointed, have a totally different appearance, being tall and shapely; the sap, as may be expected, all going to support the stem and the new-made points of the pruned branches, instead of being wasted in forming the numerous free-growing side-shoots, which, by rights, ought to have been removed by early pruning, but are often neglected till they become wide-spreading. If cutting has to be resorted to they lose a good deal of the feeding properties which for years would have gone to make up the stem and pendent branches. The same remarks apply to several other Coniferous trees known to me. For my own part, I do not see any harm in the early working of a tree to make it useful for ornament, as well as for timber-making purposes.

JAMES McNAB.

Royal Botanic Garden, Edinburgh.

IS THE FRUIT CHANGED BY FOREIGN POLLEN?

PROF. ASA GRAY has an important article on this subject in that excellent monthly, the *American Agriculturist*. At this season, when Apples of a different variety from that of the tree that bore them, or combining two sorts in the same Apple, are brought in, it is natural that the discussion of the cause and origin of such freaks should revive, and run the customary round of the papers. You ask whether there is any new evidence that pollen may act immediately on the fruit of the fertilised flower so as to impart to it, as well as to the resulting embryo, its own specific character. In reply, I would say that the only recent contribution I know of, that really throws any more light upon this curious object, is an experiment by Maximowicz, a Russian botanist. He crossed two Lilies, which differ more in the form of their pods than in anything else (the common bulbiferous Lily and *Lilium davuricum*), and the wavy pod of the one developed directly into a pod of the shape of the other. This change of shape, so caused, seems to me even more extraordinary than the change of quality or texture, such as takes place in Squashes and Melons. I should think

that the fact of such action of pollen, wholly improbable, as it seemed to be, particularly to scientific men, is now pretty well established; and I find, on looking up the subject, that all this had been made out very long ago. This ought not to excite surprise, for our ancestors were quite as sharp-sighted as we are, and if this occurs now-a-days it must have occurred in former days as well. It is said that Theophrastus and Pliny allude to it, but I cannot look up that matter now. In the case of Apples, good old Peter Collinson, the correspondent of Franklin and John Bartram and Linnæus, brought some to the notice of the Royal Society in 1745, and there is a communication in the Philosophical Transactions of that year "concerning the effect which the farina of the blossoms of the different sorts of Apple trees had on the fruit of a neighbouring tree." Mr. Cook, the author of the communication, sent to Mr. Peter Collinson some Russetings, changed by the farina of a next neighbour, whose name he wanted still to know, but could only say that the Russeting had acquired his face and complexion. Mr. Collinson then produced several samples of the Apples, an untainted Russeting, a Russeting changed in complexion which grew among a great cluster of unaltered brethren, and some Apples of the other tree which had caused the change in the Russetings, and whose fruit had in return received a rough coat from the Russetings. It is curious to notice that, when this subject came up in England fifty years ago, illustrated by new cases, both in fruits and the coats of seeds (such as Pears), Mr. Knight, the prince of vegetable physiologists of his day, declared against the idea that the pollen had anything to do with it. As the upshot of his own observations in making "some thousand" experiments with pollen, in which he found no such changes, he remarked that he conceived himself qualified to decide that in the deviations of the fruits mentioned from their ordinary character, the operation of the pollen of another variety was not the disturbing cause. Soon after he took the same ground in respect to the coat of seeds. Nevertheless sufficient positive testimony has in both cases overborne the negative, but there is no indication that Knight was ever convinced by it. At the start he was prepossessed by another theory. He had already published an account of a branch of a yellow *Magnum Bonum Plum* that bore red fruit; but, though it did this only for a single season, bearing yellow Plums the next year, Knight still clung to the view he was committed to, i.e., that it was a case of "bud variation." There is something curious in the case of these Apples of two sorts. In a strongly marked case which I examined, a *Spitzenberg Apple* was russet on one side. The flower, of course, had five stigmas. If two or three of these were acted upon by foreign pollen, and the others by their own pollen, the strongly-marked difference of colouration should have divided the Apple unequally, one would think. But exactly one half was red and unchanged *Spitzenberg*, and the other russet. I believe this is often the case. It has lately been attempted to explain such Apples on the principle of reversion. This has been suggested as a more probable cause than the action of pollen. But that assumes that the Russet has *Spitzenberg* blood in it, or *vice versa*, which is gratuitous and most unlikely. The other explanation assumes nothing except what is known to take place in strictly parallel cases.

MINIATURE EVERGREEN TREES FOR SMALL GARDENS.

THE word "Evergreenery" may be hardly correct; but I can find no other which suits my purpose so well or will better convey an idea of what I here propose to describe. Arboretum is a higher sounding word, but not applicable, inasmuch as it means a collection of both deciduous as well as evergreen trees. There are many persons residing in the suburbs of our large cities and towns who own but a small plot of land, consequently, they seldom attempt much more in the way of ornamental gardening than setting out a few cheap bedding plants, or sow seeds of common annuals, on account, as they suppose, of lack of room to do anything better. It is to this class in particular that I recommend the miniature evergreens; while others, who have plenty of land and means, can use the larger kinds in addition. There was a time, not long ago, that to talk of a variety of evergreen trees and shrubs suggested extensive grounds; but, happily for those with limited means and gardens, those days are past. During the last decade or two our horticulturists have been picking up here and there in various parts of the world many rare species and varieties of dwarf evergreen trees and shrubs, until the most enterprising among them have extensive collections of this kind, with which a most elegant display of rich and varied foliage may be made even in a very small garden. The value of these miniature evergreens for small gardens can scarcely be over-estimated—not only on account of their permanent beauty, but their appropriateness for just such places seems to harmonise with the modern ideas of high art in gardening. The

fitness of things in general is not studied or thought of by many when trying to arrange the little garden-plot in front or elsewhere about their dwellings. Hence, the frequent planting of giant Pines and Spruces, by the dozen, within limits which would not suffice for one full-grown tree.

Arbor-vitæ.—Of the American *Arbor-vitæ* (*Thuja occidentalis*), there are several beautiful dwarf varieties, well suited to cultivation in small gardens. Booth's dwarf is a very neat compact bush, and of a lively, cheerful shade of green. Globosa is, as its name indicates, globular in form, and the foliage of a deep rich green colour. Plants in my ground, fifteen years old, are 3 feet in diameter, and about the same in height, and as perfect as though turned in a lathe. *Ericoides* is a very pretty variety, with very fine soft leaves, like a Heath; hence its name. Tom Thumb is one of the most curious as well as beautiful varieties ever raised from this species. It assumes a somewhat conical form and its leaves are soft and fine. It browns in winter unless shaded. The American Golden, is a new dwarf variety, with the ends of the branches of a clear bright golden colour. It is very hardy, and the rich golden colour of its leaves gives a pleasing contrast with the dark green of other kinds when planted in groups. *Argentea* or Silver-tipped *Arbor-vitæ*.—This is a very pretty variety, with the branches tipped with white.

Eastern Arbor-vitæ (*Biota orientalis*).—Of these there are also many beautiful varieties, and some of them are worthy of a place in the choicest collections. The Chinese Golden *Arbor-vitæ* is a very pretty variety, with fine foliage of a light yellowish-green. Another variety, known as the Elegant (*B. elegantissima*), has the branchlets tipped with golden-yellow. Melden's *Arbor-vitæ* (*B. Meldenensis*) has very fine soft leaves, similar to the Tom Thumb, but not quite as rich in colour. In winter, unless protected from the sun, the leaves change to a brown or reddish colour.

Junipers.—This genus furnishes us some very desirable dwarf species and varieties. The common Savin (*Juniperus sabina*), and the variegated-leaved variety, are two of the best for small gardens, as they are low, compact growing shrubs, with fine handsome foliage. The Trailing or Creeping Juniper (*J. squamata*), and Tamarisk-leaved (*J. sabinoides*) should always be planted at the extreme outer edge of a group, as they creep over the ground or form a very dense, low bush. They are very hardy, handsome, and desirable.

Taxus, or Yews.—Few plants have been more praised in prose and poetry than the Yew, and it deserves all that it has received. I will not try to discriminate between the dozen species and varieties cultivated by our nurserymen, because one can scarcely go amiss in selecting one or more, as all are suitable for small gardens, none growing very large during a lifetime; and should a specimen pass beyond prescribed limits, the pruning knife or shears may be freely used in bringing it back. There are golden and variegated-leaved varieties, in strong contrast with the dark green foliage of the parent species. The American Yew (*T. canadensis*), should never be omitted from the list of dwarf evergreens. Its deep green foliage and bright red berries in autumn are merits which place it high in the estimation of all lovers of beautiful plants.

Pines.—There are few of the true Pines which are admissible in a small garden, or in a group of evergreens, such as I have proposed. Mugho Pine (*Pinus Mugho*), from the mountains of Central Europe, may, however, be introduced as a dwarf, although an occasional specimen will assume the tree form, instead of remaining a dwarf shrub. A handsome specimen in my garden, fifteen years old, is only about 2 feet high and 4 in diameter. If a plant inclines to grow too tall, it may be kept down by cutting off the leading shoots. Another variety, called the Knee Pine, never grows on its native mountains (the Alps) more than 3 feet high.

Retinosporas.—We are indebted to Japan for these beautiful little evergreens. One of the most desirable among these is *R. aurea-plumosa*, the foliage of which is soft, fine, and of a brilliant golden colour, fully sustaining its name of "golden plume." I fear that few persons will be satisfied with a single plant of this in a group, for, when dotted here and there among the dark-coloured foliage of other kinds, they seem to give light and life to the picture, the strong and striking contrast adding much to the beauty and brilliancy of both.

Spruces.—Like the Pines, there are comparatively few Spruces sufficiently dwarf in habit for the city or village garden. But the few that are suitable are gems of their kind, and the most beautiful of all is a native of New York State, having been found upon the banks of the Hudson, a few years ago. It is known as the Weeping Hemlock, and may be considered to be among the evergreens what the Weeping Willow is among deciduous trees—i.e., the "Queen of Weepers." I regret, however, to add that it is still scarce and not yet in market, but probably will be very soon. There are also several varieties of the Spruce of a very dwarf habit. One known as the Pigmy resembles the Norway Spruce in everything except

size—a full-grown specimen scarcely exceeding 3 feet in height. Another variety, called Gregoryana, forms a neat little dense ball of green, 1 to 3 feet in diameter, and about the same in height. There are also many other varieties belonging to the same genera or species as those named above; but I have named enough to show that there is no lack of materials with which to satisfy those who may desire to make a fine display? [Thus writes Mr Fuller in the "Horticulturist" concerning evergreens for small gardens, but a great many more charming varieties and species might be added to the above, all of which are easily obtainable in nurseries.]

DALMATIAN AND OTHER INSECT POWDERS.

By HERMANN KALBRUNER.

CERTAIN species of *Pyrethrum* have obtained considerable reputation as insecticides; the *P. carneum* and *P. roseum* both growing wild, and frequently cultivated in the Caucasus, have both proved to be excellent in this respect. In 1846, a Tiflis merchant introduced the sale of these flowers into Vienna under the name of "Persian Insect Powder." Notwithstanding that *P. carneum* and *P. roseum* are indigenous in the Caucasus and Persia, they have been successfully cultivated in many localities in Europe and North America. The climate of Lower Austria suits them very well; they are found there as ornamental plants in gardens, and they grow in northerly cool places with especial luxuriance. I have had plants of *P. roseum* in my garden during several years, and they have supported the cold of winter without shelter. Under the name of Dalmatian Insect Powder, the flowers of *Pyrethrum cinerariæfolium*, a plant that grows wild in Dalmatia, have been used. Through a friend I have obtained some seeds from Dalmatia, from which I have been successful in raising plants in my garden, where they have lived through the winter in the open air. In order to test the effect of the different insect powders, I sprinkled some flies with the powders, and took the length of the time required to kill the flies as the measure of the value of the powders. When a house fly was placed in a small flask, sprinkled with four grains of insect powder, if the powder was very powerful, there was considerable stupor at the end of one minute, followed by death of the fly after two or three minutes. The commercial insect powders behaved differently in this respect, some of them corresponding completely to the above standard, whilst others, although they quickly stupefied flies treated as above, required fifteen to thirty minutes to kill them. The druggists in Vienna purchase the whole flowers, yielded by the uncultivated Dalmatian *Pyrethrum cinerariæfolium*, and the powder they supply is a very energetic preparation. It is noteworthy that both these entire flowers and the powders prepared from them, after being kept six years, do not suffer any particular loss of activity. I have found the powder of the flowers of *P. cinerariæfolium* very active. *P. roseum* appeared to be slower in its action, which I ascribe to the circumstance that the single flowers are much more powerful than the double flowers, which appear to have little activity. The double flowers occur in *P. roseum* in much larger proportions than in *P. cinerariæfolium*; and to this fact I consider the greater activity of the latter due. The fresh (undried) flowers of both these *Pyrethrum*s will kill flies, but very slowly. The plant itself, powdered, appeared to be quite inactive. In a similar manner I have tested the powdered flowers of several Austrian Compositæ, and have found the following to be quite inactive in this respect:—*Chrysanthemum leucanthemum*, *C. coronarium*, *Anthemis arvensis*, *A. Cotula*, *A. tinctoria*, *A. nobilis*, and *Inula pulicaria*. The flowers of *Tanacetum vulgare* and *Pyrethrum corymbosum* appeared to have a very slight stupefying effect. Of all the Austrian indigenous Composites tried, only the powdered flowers of *Pyrethrum parthenium* and *P. inodorum* exercised a stupefying influence upon flies, and that only after the flies had been dusted from one to two hours; their value, therefore, as insecticides, is very slight. In a scientific aspect, it is, however, interesting to notice that up to the present time the action obnoxious to insects has only been observed in the genus *Pyrethrum*, whilst from other composites approaching very nearly to that genus the property is absent. Some years since, the *Journal de Pharmacie d'Anvers* contained an article, asserting that the insecticidal action of Persian insect powder was due to powdered flowers of *Anthemis Cotula*. I have, however, found the flowers of this species quite inactive, since flies which had been dusted with it were, after four hours, still able to fly away readily. I, therefore, conjecture that a species of *Pyrethrum* was mistaken for *A. Cotula*. The cultivation of *Pyrethrum roseum* and *P. carneum* has already been attempted in various places in Austria. The author's experiment with *P. cinerariæfolium* yielded the flowers at a slight profit. But, as very active flowers can be obtained from Eastern Asia and Dalmatia at a moderate price, he does not think that home cultivation would be remunerative.

NOTES OF THE WEEK.

— WE saw the other day some twelve hundred healthy plants of Venus's Fly trap (*Dionæa muscipula*) in Messrs. Rollisson's nursery, at Tooting. They had recently been imported from the neighbourhood of Wilmington, North Carolina, and are just now making a vigorous start. This *Dionæa* being one of the reputed insectivorous plants, to which so much attention has lately been directed, possesses an interest apart from its singular structure and fresh green colour.

— IN the *New Quarterly* there is an article on English flower gardens, which is interesting in parts; but, when the writer comes to suggestions for the future, and enumeration of materials, passages like the following do not betray acquaintance with the subject:—"Next comes that fine group of shrubs the Hibiscus, from Syria, from Africa, and from Japan, with the great bright red, purple, and yellow flowers, and leaves so variously and beautifully pinnated, that the Japanese make them a constant 'motive' of design in their best art work."

— THE index and title page for the volume ending 1874, together with a portrait of Mr. Marnock, will be published with next week's number of THE GARDEN.

— MR. CROUCHER writes to us to say that *Aloe fruticosa*, and the Abyssinian, and tree Aloes are now finely in flower in Mr. Peacock's collection of Succulents at Hammersmith.

— IT is reported that the King of the Belgians is about to erect a vast circular conservatory in his park at Laeken, from designs prepared by M. Balat.

— COCOANUTS were highly esteemed by the Mogul Emperors for goblets, for which purpose they were beautifully polished, fitted with gold rims, and adorned with precious stones. It was supposed that poison would lose its fatal properties when placed in such vessels.

— THE January number of the *Florist* contains coloured representations of Rose St. George, a fine full deep crimson variety, the smooth incurved petals being shaded behind with soft lilac-purple; and Welbeck seedling Nectarine, a kind about the size of the Elruge or Balgowan, but of a rich crimson colour, sparingly dotted with yellow. It is said to be of excellent flavour, and appears to be a welcome addition to this class of fruits.

— DR. RICHARDSON, of the University of Louisiana, writing to us from New Orleans, speaks of the great riches and beauty of the vegetation near the city of Mexico, and sends us an interesting account of the ascent of Popocatepetl, the great mountain, made by a party of which he was one. He doubts if, in any other part of the world there exists so great a variety of plants within so small an area of country as in the vicinity of Cordova and Orizaba. From the alpine to the strictly tropical is not half a day's journey. He adds, that from New Orleans to the city of Mexico is but a few day's journey—by sea to Vera Cruz, thence by rail.

— MR. QUILTER proposes to hold a series of annual flower shows in the Lower Grounds, at Aston, for the benefit of public institutions in Birmingham. He will take upon himself the cost and risk of such exhibitions, and then share the profits with the selected institutions, after the expenses are paid. The exhibition of this year will be for the benefit of the Birmingham Institute, that next year for the Sanatorium, that of 1877 for the School of Art—leave being reserved for the Queen's Hospital to take 1878. In return for his offer Mr. Quilter stipulates for the formation of a general committee from the committees of these institutions, with the addition of other gentlemen who may be disposed to assist. The first exhibition will be held on Thursday, July 1st, and on the following Friday, Saturday, and Monday for the benefit of the Midland Institute Building Fund.

— THE January number of the *Botanical Magazine*, contains coloured figures of the following new or rare plants:—The Horned Gum tree (*Eucalyptus cornuta*) of Australia, which in cultivation at Kew, in the great temperate-house, forms a small tree 9 to 10 feet high, and flowers every year from the old wood. The flowers are borne in globose heads from 4 to 6 inches in diameter, the extinguisher-shaped covering of the yellow anthers being of a vivid scarlet colour.—*Crocus byzantinus*, a native of Transylvania, and a favourite in many old-fashioned gardens, has been cultivated in this country for the last two or three centuries. Its showy triangular flowers are of a deep purple-lilac colour.—*Jamesia americana*, a very pretty white-flowered plant nearly related to the Hydrangeas and the Saxafrages. Its dull, green, hairy leaves are oblong and serrate, the flowers being borne in terminal panicles.—*Blumenbachia chuquitensis*, a densely hairy plant nearly related to the pungent Loasas, having lacinate deep-green foliage of erect growth and brilliant flowers, scarlet without, and golden-yellow within.—*Odontoglossum maxillare*, a showy species, from Mexico, said to be nearly related to *O. Cervantesii*, but it has far more affinity with *O. cordatum* and *O. maculatum*,

from which it is easily distinguishable by its white flowers. The segments are blotched with purple at the base, the lip blotched with orange-yellow.

— A NEW botanical annual, intended chiefly as a record of progress, has been started under the editorship of Dr. L. Just, of Carlsruhe. It is entitled *Botanischer Jahresbericht*.

— THE presentation of the Cutler testimonial, consisting of a silver tea and coffee service, &c., subscribed for by the members of the Gardeners' Royal Benevolent Institution, will take place on Thursday next, the 14th inst., after the annual general meeting of that charity, which takes place on that day.

— IT has recently been shown by M. Baillon that the leaves of plants are capable of absorbing water. He has been experimenting by sowing Peas in a box of such a construction that the plants can be immersed in water without the roots or the soil in which they are growing becoming damp. He has kept Peas alive for two months without giving the roots any water whatever, the soil being virtually quite dry.

— THE fields of Sugar-beet near Sacramento, California, are reported to have been saved a short time back from destruction by vast armies of caterpillars through the labours of a flock of 3,000 turkeys. The struggle was evenly balanced for a time, and then success wavered, first one side gained, and then the other; finally the turkeys triumphed, with the loss of one over-gorged victim, from whose crop alone were taken 1,500 caterpillars.

— MR. ATKINS, of Painswick, has sent us specimens of *Cyclamen Atkinsii*, which have withstood 25° of frost in the open air without injury. The thick tufted leathery foliage, prettily marbled with silvery-grey and the short petalled white flowers, blotched at the mouth of the tube with dark purplish-crimson, render this one of the most interesting of Cyclamens, and one which, as a winter-blooming plant for sheltered nooks in the rockery or in the wild garden, has few equals.

— SIR THOMAS D. ACLAND, BART., M.P., was summoned before the magistrates at Exeter the other day, for neglecting to have the hedges trimmed and trees lopped in various parts of his estate. In defence the hon. baronet said his father was fond of preserving the picturesque features of the Devonshire lanes, and out of respect to his memory the trees and brushwood had been left in their natural growth. An order was made by the magistrates for the removal of the cause of complaint.

— MR. W. PHILLIPS, of Shrewsbury, proposes to publish, under the title of "*Elvellacei Britannici*," dried specimens of the larger Ascomycetous Fungi. To persons forming collections of our indigenous Fungi, Mr. Phillips's fasciculi will be useful, since similar collections have hitherto principally comprised only the Hymenomycetes. Mr. Phillips will be assisted by various well-known mycologists, and he proposes to issue a very limited number of copies at 12s. each fasciculus of fifty species.

— M. GAILLARD has lately exhibited, according to the *Revue Horticole*, some very extraordinary Gourds, of various forms and colours, which, although attached to each other, are of different species. This has been accomplished by grafting the fruit of one kind upon that of another, when it is found that perfect adhesion takes place, and that the growth of each fruit continues unretarded. One example given is that of a green Spanish Gourd, upon the side of which another variety has been grafted. Another is that of a yellow Apple-shaped Gourd, into which was inserted the stalk of a green Pear-shaped one, a large section of which was cut off and replaced by a corresponding slice of a white-fruited Gourd; in all cases a perfect union has been effected.

— IN a lecture delivered a few days ago at the London Institution, Sir John Lubbock said:—"The observations commenced by Sprengel and recommenced by Darwin seemed to have given to flowers an additional interest, and had shown that insects, and especially bees, had an importance previously unsuspected. To them we owed the beauties of our gardens and the sweetness of our fields. To them flowers were indebted for their scent and colour, indeed their very existence in its present form. Not only had the brilliant colours, the sweet smell, and the honey of flowers been gradually developed by the unconscious agency of insects, but the very arrangements of the colours, the circular bands, and the radiating lines, the form, size, and position of the petals, the arrangement of the stamens and pistil—all had reference to the visits of insects, and were disposed in such a manner as to ensure the great object which these visits were destined to effect." Probably few will go so far as this with Sir John—even of those who see how animals and plants may influence each other in the struggle for life. Sir John's illustrated essay on this subject has been published by Messrs. Macmillan this week.

THE FLOWER GARDEN.

CULTURE OF THE GLADIOLUS.

THOSE who wish to have a fine display of Gladioli next summer must now begin to prepare beds and clumps for their reception. Bulbs intended for planting should be obtained now, when they are well ripened, plump, and sound. The best time for planting is in March, commencing quite early in the month if the weather is at all favourable. In order to secure an effective display and, at the same time, afford the plants an opportunity of fully developing the beauty of their flowers, they should be planted in beds, formed in rows not less than 18 inches apart, with a clear space of a foot between each bulb in the line. Some cultivators have recommended pitting the bulbs preparatory to planting them out, and growing them on for a time before transplanting them to the open ground; but experience has proved that no advantage is derived from such a practice. Some have recommended planting as early as January or February, but it is best done in March, for that is early enough in the year to give the plants a beneficial start, while the risks of rotting or being otherwise injured through heavy rains in the earlier months are considerably lessened. If a few late flowers are required, the planting of some of the bulbs may be deferred till the middle of April, in order to ensure a succession of bloom. The preparation of the soil is an important point.

A deep loam suits the Gladiolus best, and the bed in which the roots are to be planted should be previously well trenched to the depth of 18 inches, digging in, at the same time, a good dressing of well-decomposed manure. Thoroughly rotten vegetable refuse and wood ashes, as well as some crushed bones, greatly assist in the development of the plants. As soon as the growth begins to appear through the soil, a thin dressing of fairly dry rotten manure may be put on the surface of the beds, a dressing from which they will derive great advantage, increasing the quantity as the plants mature their growth and the height of summer is reached. The course of treatment during the summer includes the keeping of the beds clear of weeds, and giving occasional stirrings to the surface. When the flower-stems reach a foot in height, each should be carefully tied to a stake to support it, and

preserve it from harm from wind, which is very apt, unless the flower-stalks are properly supported, to twist them off close to the bulbs. In dry weather frequent sprinklings overhead and good surface waterings will be necessary, though the dressing of manure will do much to keep the bed moist and cool. In tying out the flower-stems to stakes and supports, be careful not to tie them too tightly; sufficient space should be allowed to admit of an unfettered upward growth. Continue to tie as they advance in height, or the bed will have an irregular appearance. The taking up and storing of the bulbs is a matter of considerable importance, and the removal of the roots from the beds should not be deferred till the stalks die down completely. It is best to lift them when the leaves turn yellow, and cut away the decaying flower-stems to within 6 inches of the bulbs, and the latter should then be placed in a cool airy place to dry. They should be put in drawers, baskets, or bags when ready, and be laid in a moderately cool and dry place, each variety being kept separately and distinct, and correctly named. Frost must be guarded against, for a severe one will cause many of the bulbs to rot. In such a place the roots can remain till planting time comes round again, examining them occasionally to see that no harm results from damp. When the bulbs are lifted it will be found that some of them have formed a few smaller bulb offsets, while others will have produced round the base a larger number of roots of small size, denominated "spawn." In the former case the offsets may be allowed to adhere to the bulbs till thoroughly dry or wanted for planting; in the

latter case the spawn should be removed when the bulbs become dry. If it is desired to save the spawn of choice varieties, it should be planted out closely together in a prepared bed in the spring; and, if some attention be given it during the summer months, such as keeping the plantation free from weeds, watering, &c., a good many of the spawn bulbs will grow sufficiently strong to flower the second year. Most cultivators of the Gladiolus like to try their hands at raising seedlings. It is not a difficult matter, and seed is freely borne and ripened. Seed saved from the best varieties may be sown early in April, either in pans or shallow boxes, or in prepared soil of a fine and rich character in the open ground. When the plants begin to show themselves, they should be encouraged with a little weak manure-water, occasionally administered. When large enough to be transplanted, they should be planted out in beds, about 4 inches apart each way, in some good light soil, and encouraged to make all the growth possible during the season. A large number of the seedlings will flower the second or third year from the time of raising. As to kinds, the following are fine in quality and distinct in character—viz., Ada, salmon-red, white throat; Beauty of England, white, with purple throat; Coronet, bright red, the throat flamed with white; Distinction, orange-rose, purple throat; Grandeur, blush, flaked with carmine, extra fine; Julia, pink, suffused towards the edges with carmine, and very purple flakes, very fine; Lord Derby, crimson, very fine; Medina, flesh, flaked with violet;

Miss Warren, cerise, with white throat, very beautiful; Modesta, crimson, shaded with maroon, very fine; Mr. Greenville, violet-rose, striped with lilac, very fine and striking; Mrs. Stuckey, clear rose, tinted with violet, and flaked with purple, beautiful; Pluto, orange-scarlet, yellow throat, very fine; Opalia, orange-rose, the yellow throat flaked with violet-rose, very fine; Orphée, rose, flamed with carmine; Plauda, crimson, the white throat blotched with violet; Prince Arthur, white, flaked with lilac-purple, very fine; Remarkable, lilac, flaked and mottled with purple, very distinct; Robert Fortune, carmine, flamed with crimson in the throat; Sentinel, purplish-rose, flaked with lake; Sybil, canary-orange, throat striped violet; Titus, lilac, flaked with violet; Virginalis, pure white, bordered and flamed with rose; and Volano, dark rose, flaked with a darker hue, pale throat. Messrs. Kelway and Mr. Sampson, in this country, and

M. Souchet in France, have made Gladiolus culture a speciality, and many fine kinds have been raised by them. Prominent among French varieties of recent date may be named the following, all of which are distinct and fine, viz.:—Ambrose Verschaffelt, Asmodée, Belladonna, Humboldt, Delicatissima, Eva, Horace Vernet, Jupiter, L'Unique, Madame Desportes, Maréchal Vaillant, Margarita, Mary Stuart, Michel Ange, Minerva, Mozart, Octavia, Ondine, Ossian, Blanche, Rosa Bonheur, Sappho, Semiramis, Sir John Franklin, Sultana, Talisman, Variabilis, Venus, and Zelinda. Quo.



Yucca Treculeana.

YUCCA TRECULEANA.

THIS species, represented in the accompanying illustration, is one of the most remarkable of its kind as regards general appearance and the size to which its leaves attain. The stem, which is about 10 inches in diameter, is furnished all round with leaves about 3 feet 6 inches long, straight, thick, deeply fluted, and tapering off to a sharp point. They are dentated at the edges, which are of a reddish-brown colour. The flower stem, which rises upwards of a yard, consists of a mass of branchlets about 18 inches in length, bearing multitudes of cream-coloured flowers, shining as if glazed. This variety of Yucca originally came from Texas, whence it was brought by Mr. Trecul about the year 1850, and it grows so luxuriantly that it is not rare to see specimens of it measuring over 6 feet in diameter.

THE FRUIT GARDEN.

GRAPE VINES.

(SECOND YEAR'S TREATMENT.)

At this stage it will be necessary to say a few words on the subject of temperature. On this point, a few noteworthy fruit-growers allow considerable latitude, preferring rather to be guided by circumstances and weather conditions, than by hard and fast rules. With the Vine, however, in the earlier stages of forcing, unnaturally, not to say injuriously, high night temperatures have been the rule hitherto, though a certain reaction appears to be setting in in this respect. If we compare the night temperatures generally recommended for the Vine, from the starting period till the setting of the fruit, it will be found, that they far exceed the average night temperature during the same period of growth in those countries most favourable to the Vine; and what makes the matter worse, these excessively high temperatures are given under circumstances which only increase their power of mischief; as, for instance, when the Vine is forced in a Vinery under our cloudy skies, and during the long dark nights of winter and spring. When the Vine is growing, the night temperature must, of course, bear some proportion to that of the day; but night is the period of rest to plants, which rest means a suspension of those exciting influences—heat and light—under which, combined, perfect growth can only take place. Physiologists tell us, and experience proves, that though the shoots will lengthen nearly as much by night as by day, under a disproportionately high temperature, no new material is formed. What takes place is, in the words of Dr. Lindley, “simply an extension of the tissue formed during the day,” and the consequences are weak wood and foliage, that can ill resist the parching effects of hot-water pipes, a feeble constitution, insect attacks, and other evils, in the way of scorching &c., that the gardener is only too familiar with. Bearing these facts in mind, I have deviated considerably from the beaten tract, and have, when hard firing would have been necessary to sustain the desired temperature, subjected all sorts of Vines, and notably Muscats, at all stages, between the starting of the Vines and the setting of the fruit, to a night temperature, that would at one time have been considered so low as to be fatal to the setting process, and injurious to the Vines generally; but with results so actually favourable to the health of the Vines, and the setting of the berries, that I adhere to the practice in all cases, and have no hesitation in recommending it to others, as being probably most in accordance with Nature, safe, and, without doubt, the most economical as regards fuel. I have repeatedly subjected Muscats to a temperature of from 50° to 55° at night, for a fortnight at a time, according to the weather, from the time the flowers first opened till all the berries were set, damping the house as usual, and occasionally syringing the Vines and bunches in the afternoon, and the berries have invariably set as thick as Hamburgs generally do. I put the success down simply to the sturdy vigour acquired by the shoots and bunches, through the absence of high and stimulating night temperatures, for I depart but very little from the usual day temperature. One fact, which I regard as conclusive evidence that a low, or resting night temperature is favourable to the fertilisation of the berries, is the number of stones or seeds they contain. Under high and dry setting temperatures I have never found the berries of Muscats to contain more than two or three seeds, but since I adopted low temperatures I find the average number is about four, and not unfrequently they contain five. In practice, therefore, instead of adopting a night temperature, which, in the usual acceptation of the term, means reaching the minimum about dusk, and sustaining it by fire-heat, if necessary, till the following morning, the rule should be to reckon the maximum at noon, and the minimum at sunrise, as I pointed out in your last issue. Further particulars will be given when we proceed to the details of the second year's treatment, and the directions given under this head will also be applicable to subsequent years. The beginning of March is soon enough to start the Vines the second year. Before this the Vinery should be thoroughly washed with soap and water. The Vines also may be washed, though I never found painting and

dressings exert the least influence in checking spider and other insects, if the treatment generally was such as to encourage these vermin; consequently, I never take the trouble of scraping and painting the canes before starting. The Vines may be unslung and laid horizontally along the wires, in order to induce the regular breaking of the buds, but, with well-ripened Vines, started about the natural season, this practice is not absolutely necessary. The inside border should first receive a good soaking with water at a temperature of 75° or 80°, and afterwards be covered with a bed of leaves (if these can be procured), laying them in a ridge along the middle of the border, or between the rows of Vines; but taking care that they are not packed against the stems of the Vines, as it causes the latter to emit roots at the wrong place. For similar reasons the heaps should be turned at least once a month, as the roots are sure to take possession of the leaves if this be not done, and will have to be sacrificed when the leaves are removed in autumn. For the first fortnight no fire-heat will be required at night, unless the weather is severe; but on cold dull days it will be necessary to apply a little heat in order to raise the temperature to 55° or 60°, and in bright days it may be allowed to go up to 70° or 75°, always observing the directions given under the head of airing and damping, &c. The object should always be to apply heat with light; if the temperature falls before sunrise to 40°, or even to 35°, no damage whatever need be apprehended. As to temperature generally, it will suffice to state here that a rise of about 2° per week should be allowed, until the night temperature reaches 70° or 75°, and the day temperature 85° or 90°, according to the varieties grown. This is allowing the maximum to be reached in about three months from the time of starting. I give this scale simply as a general guide, which might be strictly adhered to if the weather out of doors advanced steadily at the same rate; but this cannot be depended on, and of course a considerable abatement must be made on dull days and cold nights, when very hot pipes would be required to sustain the temperature at the proper figure. On such occasions an abatement of 5°, 7°, or 10° on the above scale will never do harm, but good, especially at nights, always making up for any loss in this way by going about as much above the scale in fine days, by shutting up early, and also by firing, if necessary, with sunshine. It will be found in practice that this compensatory system is the safest, and in every way the best, in this fickle climate of ours, with the Vine when grown under glass. Having given these directions, it will only be necessary for me now to speak of the training of the Vines and thinning of the fruit. As soon as the Vines have fairly burst their buds, they must be moved from their horizontal position, and tied to the wires in their proper places. The treatment of the permanent plants consist in carrying the leading shoots forward to the top of the house and there stopping them, as in the previous year; the side laterals must also be pinched as before directed, for these will push strongly when the leader is stopped. Those shoots which break from the last year's wood, below the base of the leader, should be stopped at the fourth or fifth joint; any bunches they show must be removed, and when they will bend without breaking, they may be tied to the wires. As to the supernumeraries: when it is seen which buds are the strongest, and which show the most promising bunches, they should be thinned by rubbing off the weakest with the finger and thumb, so as to have the shoots about 9 inches apart on each side, and they should be stopped one or two joints before the bunch, and tied to the wires when they will bear it; care must be taken that they do not come in contact with the glass before this can be done. After this period the treatment consists in pinching the laterals regularly at every joint, and thinning out the wood occasionally as it gets crowded, so as to expose every leaf to a good light. The front row of supernumeraries will have no room to extend themselves at the point, but the back row may be allowed to make a few feet of young wood in order to increase the bearing area the following year. When the Vines come into flower, extra care will be required in giving air so as to prevent sudden gusts of cold air, or great fluctuation of temperature during the day; otherwise no different treatment as regards temperature, syringing, or damping, is

required; the Vinery at this stage, as at other times, should be allowed to get dry during the greater part of the day, except when the usual sprinkling of the paths and borders, &c., takes place to prevent aridity, as before recommended. As soon as the berries are fairly set the number of bunches should be reduced to from four to six on each Vine, according to the size of the bunches and the vigour of the Vines, but with an eye to their even distribution over each plant.

Thinning the Berries.

All the bunches will not set simultaneously; but thinning must commence with the earliest set bunches before the berries are much larger than pin-heads (except in the case of Muscats and shy-setting varieties, which must be left until it is seen which berries are taking the lead), and it will be found by far the least laborious practice to follow it up as fast as the bunches set. It is difficult to give written instructions as to thinning, as much depends upon varieties and the vigour of the Vines, &c.; but, as a rule, Hamburgs and Muscats, and all the large-berried kinds, will require from three-quarters of an inch to one inch of space, cubic measure, to each berry, and other varieties a little less. As a rule, the inexperienced operator errs by leaving far too many berries; a bunch of Black Hamburgs, for instance, when thinned properly, looks to be simply decimated to the non-professional eye; but all good Grape growers use the scissors freely, and cut out from one-half to three-fourths of the berries in well-set bunches. The operator should begin with a pair of clean, sharp, and easy-working scissors, and with a smooth peg or stem of a Vine-leaf in the left hand and the scissors in the right, he should begin at the bottom of the bunch and work up to the top, easing the shoulders with the peg while he works the scissors, and, as far as possible, doing the thinning by cutting out the small berries and leaving the big ones, always remembering that most room is made by cutting out the inner berries. Cutting off the berries at the extremities of the shoulders only reduces the size of the bunch without easing the others to any extent. After thinning, the treatment is only a question of temperature, airing, damping, pinching, &c., as before directed. The temperature should not be lowered till the Grapes are ripe; but, after that, it may be gradually reduced with increased ventilation and a much drier atmosphere, until fire-heat is entirely discontinued, except when it may be necessary to expel damp for the sake of the fruit. J. S. W.

(To be continued.)

RIPENING OF THE WOOD IN PEACHES AND NECTARINES.

In its natural state the Peach tree grows as a standard, and we can conceive that under the bright sky of Persia—its native country—every twig or leaf must have the full benefit of the light and air, and that the wood and buds must consequently be thoroughly matured. Perfect maturation is all that the most favourable climatic conditions can accomplish, and is in fact the whole secret of success. In this country the ripening of the wood is the chief difficulty we have to contend with; this important end secured, good crops of fruit annually should be a certainty, were over-cropping avoided, and ordinary precautions taken against accidents during the flowering season. Half the failures that occur may safely be put down to ill-conditioned immature growth, and all beginners in Peach culture should realise this fact at the outset, and get to understand what maturity means, and what a well-ripened Peach-shoot is like. In our insular climate, the thorough maturation of the wood is not always easily secured, even with the assistance of glass and hot-water pipes. With Peaches that are forced early there should be no difficulty in this respect, one would think; but often enough these fail from the same cause, brought about by bad training and mismanagement. A well-drained border, a strong firm soil, enriched as often as needful, heat, light, and air, are the essentials needed to reduce the crude juices of the plant to the hardened tissue and plump buds which alone can produce fruit of good quality. There is a reluctance among many to manure Peach borders; but manure will do no harm where the roots have to push their way through a hard medium, and where heat and light are brought to bear upon the wood and foliage in proportionate intensity. The most remarkable Peaches for size and quality I ever saw were produced by trees that were annually highly manured by mulching or otherwise, and where strong wood, well ripened, with evenly distributed vigour, was aimed at and

secured by high temperature and thin training. One of the most prevalent mistakes in Peach culture on walls and trellises is thick training. It is the rule, almost without exception, to lay the wood in so thickly during the growing season that the trellis is completely thatched, and quite impervious to the light. The leaves on the upper side of the branches only get the full benefit of the light, but those on the under side are in the dark, and they are so crowded together between the shoots that they actually become to a certain extent blanched. Now, what result, other than failure, partial or complete, can be expected from such treatment? Trees trained to a trellis inside a lean-to structure are already disadvantageously placed as regards exposure to the light and air, and the evil can only be compensated for by careful training and ventilation. Far too much wood is, as a rule, laid on during summer, through nervous anxiety to provide an ample supply of heavy wood for the following season—the operator calculating upon reducing the quantity at the winter pruning, should it be necessary; and in this way future success is sacrificed for a purely imaginary gain in the meantime. Crowding produces two or three indifferently matured spindly shoots for one that is thoroughly so. The shoots should be wide enough apart, when in full foliage, to permit a free play of light and air among the leaves. Though the shoots may appear to be thinly distributed, the chances of a healthy blossom, a thick-set and a heavy crop of fruit, are increased tenfold. A healthy Peach shoot, when in leaf, measures 1 foot or more across—i. e., the leaves are about 2 inches diameter, 6 or 7 inches long, and are borne about 1 inch apart on the shoots. If growths of such luxuriance are tied into a trellis, which exposes only one side to the light, about 2 inches apart—as is commonly done—is it possible for each leaf, upon the healthy development of which everything depends, to have more than a mere modicum of justice? I leave Peach-growers to study this question. Here I give each summer shoot 6 inches to itself, though I admit a foot would not be too much. At the same time I untie all the branches, great and small, in winter, lay them out easily on the trellis, in which position the shoots all stand up towards the glass, and are swayed to and fro with each puff of air; and they are left in this condition till the trees are disbudded the last time and the fruit stoned. They are then tied to the trellis in the usual way; but I never aim at geometrical precision in training—straight-lacing is always to be condemned. Lay the shoots in easily, never tie them too near the point, and always take care that the growing point is well up and exposed to the light. During the growing season, whenever you think the shoots are getting too crowded, cut them out without fear. Always see that the sun shines through between the branches upon the floor beneath. This is a pretty safe rule. Trees trained in this way should require little or no pruning in winter; that is, presuming the young shoots are left entire, and not tortured at all. Not of less importance to their training, as an aid to maturation, is ventilation. Providing the proper temperature can be maintained, and avoiding cold draughts, the ventilation can never be too abundant. Too much moisture in the air is prejudicial, more particularly with a high night temperature. Plenty of water at the roots is essential; and when this is secured, damping and syringing is quite unnecessary, unless it be practised with a view to keep down insects, or to counteract the scorching influence of very hot pipes. When hard firing is not necessary the air is always moist enough for Peaches. It is a dry sunny atmosphere which produces that dark leathery foliage, and jointed brown-coloured wood with plump buds, which alone indicate perfect ripening. J. S.

GRAFTED ORCHARDS.

GRAFTED orchards, apparently, do not pay, if we may judge from the following extracts from a letter in the *Mirror and Farmer*:—My orchard is a good one; the trees are thrifty and bear well. I set them out and grafted them myself nearly twenty years ago, and for eighteen years I have tended, cultivated, and manured them; but were I going to live my life over again I would never try to raise another large orchard of grafted fruit. Why? Because it does not pay. My orchard will yield a hundred barrels of Baldwins, which, at 8s. a barrel, will bring in £40, and this, you may imagine, is all profit. But, when you come to look into the matter, you will find that that is not the case. For the expenses of picking, sorting, barrelling, and drawing come to £17 10s., and if you divide the remainder by two—for the trees only bear every other year—you have about £11 5s. as the income of the best field I have, which had to be cultivated ten years, and which now has to be manured to raise a good crop of Grass. But the kind of orcharding that does pay is this: On a hill, not far from my field, is a number of old scraggy Apple trees loaded with Apples about as large as pullets' eggs, not one of which is fit to be eaten raw or cooked; yet more money is made out of them than out of my Baldwins, which, had I

my wish, I would change into the old-fashioned trees yielding fruit only fit to be made into cider. Cider is the best paying crop I have. There is no particular secret about making cider, and yet its quality depends very much upon how it is made and what it is made out of. In the first place you cannot make first-rate cider out of windfall grafts. I do not know why, but so it is. If I were going to make a premium barrel of cider I would take sound fruit and have, if convenient, part of it sweet, then grind it in a mill that crushes instead of cuts the Apples; let the pomace stand in the trough twenty-four hours, and "cheese" it with clean Rye straw. When it comes to barrelling the main thing is to get a sweet clean barrel, that is, if you want pure cider to drink during the winter or spring; but if you want a drink for next summer or next year which is as stout as old rum, you can get it by putting in a pound of sugar to every gallon of cider.

Grapes Travelling without Packing Material.—Mr. Thomson has sent many tons of Grapes from Clovenfords to London without any packing between the bunches, and, I have been told in Covent Garden, that such packages arrived in as fine condition as if the fruit had never been packed. The baskets used for this purpose hold about 16 lb. of Grapes. Previous to placing the fruit in them, a thin layer of paper shavings is laid over the bottom and all around the edges of the basket, after which, filling is begun at one end, the bunches being put into position closely, and gently pressed against each other until the basket is full; on the slightest concussion the berries work themselves into the vacant spaces, and the whole becomes, as it were, one huge bunch. Besides the safety to the fruit, this system has other advantages—all expensive packing material is saved, and a considerably greater quantity of fruit can be got into a given space than when packing is employed; something, however, should always be placed between the basket and the fruit. Large quantities are easier packed thus than small samples; but both may be sent in this way, at any time, and any kind will withstand such carriage. Cotton, or any other kind of wadding, should never be placed in contact with Grapes, unless they have previously been carefully wrapped up in a clean sheet of tissue paper.—M.

St. Michael Pine-apples.—These were but scantily imported when I used to visit Covent Garden; the principal supplies of this fine fruit then came from the West Indies, and, in my opinion, were greatly inferior to home-grown produce. This fact, I imagine, has led many to suppose that the qualities of the St. Michael Pines have been overrated; but owing to the way in which they are cultivated there, and the careful manner in which they are imported, I can easily believe that they are good in quality. There is one statement made in reference to them, however, which I cannot clearly understand, and that is their being great favourites with dealers on account of their being invariably sounder at the core than fruit grown at home. St. Michael Pines are grown quite in a natural way, and these being sound at the core indicates that any decay found in home-grown fruit must be the result of artificial appliances, and what I would like to have fully explained is, how black-heartedness occurs. I have previously stated that I am convinced that any discolouration at the heart is the direct result of over-watering and of giving water after the fruit had begun to colour. This opinion was, however, contradicted. British fruit-growers, and young Pine-growers in particular, will, however, now be somewhat galled to know that foreign Pines are sought after in the market on account of their superiority over their own productions. Such being the case, I trust that those who are so ready to confute well-grounded propositions will no longer keep the "true cause" of this black-heartedness a secret, but will publicly explain the whole matter. It is not just to suppose that this rottenness is confined to fruit furnished by market growers only.—J. MUIR.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Raisin de Calabria and other Late Grapes.—Mr. Thomson states, in the *Gardener*, that he has at present the Raisin de Calabria more of a golden colour than any Muscat or other Grape he has ever ripened; and, he adds, that in quality, such sorts as Buckland's Sweetwater and Foster's Seedling, among earlies, are only third-rate in flavour in comparison with Raisin de Calabria. The very same remarks apply with equal force to Trebbiano and Syrian, and to that noblest-looking of all late black Grapes, Gros Colman. When well ripened, Alicantes and Lady Downes for the months of November, December, and January, are not worth eating as compared with Gros Colman.

The New Yellow-barked Peach Tree.—This is emphatically recommended for general culture by M. Carrière, editor of the *Revue Horticole*. It is perfectly hardy, its constitution is robust, and its fruit large and of excellent flavour. The yellow bark renders the tree an ornamental object in winter.

THE LIBRARY.

THE INSECT.*

Few scientific writers have the peculiar ability to divest their subject of what the general reader would call hard, dry minutiae, and clothe it with the charms of poetry that must appeal to all who are lovers of the beautiful. M. Michelet is, however, one of these, and in this, the last of his remarkable works, he has, if possible, excelled himself, and has given the world a book that, for beauty of thought, for elegance of language, and for the pure scientific knowledge that forms the basis of both, must render it a favourite both with the student of pure entomology, and with those who content themselves with a less profound but none the less charming acquaintance with the marvels of insect creation. M. Michelet has, ere this, been accused of errors and inaccuracies that a more practical and less imaginative writer would, it is said, have avoided. The accusation may, in a remote degree, be deserved, but this by no means decreases the general value of the work, for the errors are rather those of exaggeration in description than of any want of knowledge or absolute perversion of fact, and the playful fancy that gives the book so attractive a form will find its reward in the number of those who are likely, after its perusal, to take up the study of a physical science that it has been too much the fashion to decry on account of its alleged uninviting details. M. Michelet shows that a close observation of these details may be carried on side by side with, and, in fact, be the result of the tenderest sympathy with the minute objects of his interest, and that it is quite possible to give the reins to deep, impulsive, poetic feeling, and yet be fairly analytic and philosophical; this much we may say of the book itself without any wish to give more praise than is justly due.



The Woodpecker.

With respect to the illustrations, with which the work absolutely teems, it would be impossible to say too much in their favour. The fact that they are drawn by Giacomelli is a sufficient guarantee that they approach as near as possible to perfection. They must, however, be seen, for no description can convey an idea of their excellence both as regards drawing and engraving. We give two of these woodcuts as examples, with the accompanying letterpress, which will enable the reader to form his own opinion both of the beautiful language of M. Michelet and the artistic skill of M. Giacomelli. Of the Forest of Fontainebleau, M. Michelet writes as follows:

Even in the hours of silence, the forest occasionally finds a voice, a sound or a murmur which recalls to you the remembrances of life. Sometimes the industrious woodpecker, laboriously toiling at its task of excavating the Oak, cheers itself with its singular cry. Frequently the heavy hammer of the quarryman falling and falling on the sandstone, resounds in the distance with a hoarse dull echo; and, finally, if you listen attentively, you catch a significant hum and see at your feet legions of ants—countless populations, the true inhabitants of the place, speeding over the withered and falling leaves. So many images are these of persistent toil, which blend with the fanciful a serious gravity. Each in his own way digs and digs, and do thou, too, pursue thy work and exhume and stir up thy thought.

Writing of the nymph or chrysalis, M. Michelet gives us the following remarks upon that wonder of metamorphoses:

In truth it is a thing to confound and almost to terrify the imagination to think that a gnat, at the outset no bigger than a thread, should include in itself all the elements of its moultings and metamorphoses; should contain its triple and even octuple envelopes; nay, more, the sheath or case of its *nympha*, and its

* "The Insect." By Jules Michelet. With 140 Illustrations by Giacomelli. London: T. Nelson & Sons, Paternoster Row.

complete butterfly are folded up in another, with an immense apparatus of vessels—respiratory and digestive—of nerves for feeling, and muscles for moving. A prodigious system of anatomy! first traced out in complete detail in Lyonnet's colossal work on the Willow Gnat. The two-fold monster, endowed with a strong grub-stomach for the destruction of innumerable hard leaves, will possess, ere long, a light and delicate apparatus for extracting the honey of flowers. And yet the clothed creature which contains in its organism a complete silk manufactory, will almost immediately sweep away the complex system. One knows the gentle manoeuvres by which Nature conducts the young of the higher animals from the embryonic existence to the independent life, adapting the old organs to new functions. Here this is not done. It is not a simple change of condition. The destination is not merely different, but contrary, with a violent contrast. Therefore, instruments fitted for an

entirely novel existence are required, and the abolition and definitive sacrifice of the primitive organism. The revolution which, for all other beings is so well concealed, is here entirely thrown open; and we are enabled to scrutinise with our eyes this astonishing operation in numerous grubs which undergo the great change in the light of day, suspended to the branch of a tree by a silken cable. The effort is worthy of our admiration and pity. To see yonder nymph, short and feeble, soft and gelatinous, without arms or paws, contriving, by the skill with which it expands and contracts its rings, to escape from the heavy and rough machine which it was at first, flinging aside its limbs, setting free its head, and—one hardly dares to record the fact—throwing off its body and rejecting many of its principal internal organs! This little body, when it has thus escaped from its long heavy mask (living, nevertheless, but a moment since a life full of energy) will dangle and grow dry and skilfully ascend to its silken fastening. There it prepares to fix itself in a new "me" as a nymph, while its former "me" tossed about by the wind, is speedily driven I know not wither. All is, and ought to be, changed. The legs will not again be the legs. It will need lighter organs. What can the child of the air, which can balance on the point of a blade of Grass, do with these coarse short feet armed with hooks, vent holes, and so many heavy implements?

The Snowberries.—Botanists and gardeners alike have got things a little confused in regard to these plants. Dr. Asa Gray has recently contributed a paper to the "Linnean Society's Journal," clearing up some matters in relation to the botanical question; and we, *Gardeners' Monthly*, may as well say a few words as to the other. The common red Snowberry of our garden—the Indian Currant of some localities—is usually referred to in our nursery catalogues as *Symphoria glomerata*. This is Pursh's name. The generally accepted name is that of Michaux, which is *Symphoricarpos vulgaris*. It is rather common in shrubberies, but not so much so as it deserves to be. Dr. Gray makes eight species; but this is the only one with red fruit.

Dr. Gray, however, describes a new species found in Nevada, with flowers half an inch long, which he names *S. longiflorus*. Its fruit is probably white. The other species—common in gardens—is the white Snowberry, *S. racemosus*, of Michaux. These two are the only ones that seem so far to have got into cultivation. There is another species allied to the white Snowberry, which grows west of the Mississippi, and east of the Rocky Mountains, which is a stronger grower than that in our gardens, and is worth introducing. This is *S. occidentalis* of R. Brown. There is another very pretty little bushy species in Colorado, which most of us who have collected have named in our herbariums *S. montanus*. This Dr. Gray now refers to one previously named by him in Wight's Plants of Texas, *S. rotundifolius*. The true *S. montanus* is a Mexican species. Three supposed Mexican ones, including *S. montanus*, are united under the one name *S. microphyllus*. The other species not yet in cultivation,

is *S. mollis*, of Nuttall, in California, and *S. oreophilus*, which also has been confused with *S. rotundifolius*, as *S. montanus* in Colorado herbariums. In the paper Dr. Gray has some interesting observations on the nature of the fruit, showing that it is not a berry, as some botanists believe, but a species of drupe.

Movement of the Sap in Plants.—Dr. M'Nab, of Dublin, has been making a further series of experiments on the amount of transpiration from the leaves of plants and on the ascent of sap through the stem, with the following results, the plants experimented on being the Cherry Laurel (*Prunus laurocerasus*), Privet, and Elm:—1. That under favourable circumstances a rate of ascent of 40 inches in the hour can be obtained. 2. That, contrary to the generally received opinion, direct experiment has shown that the upward rapid current of sap does not cease in the evening. 3. That checking the transpiration for a short time by placing the branch in darkness does not materially retard the rapid current of water. 4. That the removal of the cortical tissues does not impede the rapid current in the stem, which moves only through the wood portion of the fibro-vascular bundles. 5. That a well-marked rapid flow of fluid will take place in a stem

after the removal of the leaves. 6. That fluid will rapidly flow downwards as well as upwards in the wood portion of the fibro-vascular bundles, as seen in a branch in which lithium citrate was applied at the top. 7. That pressure of mercury does not exert any very marked influence on the rapidity of flow, in the one experiment made with a pressure of 110.53 grammes of mercury. Dr. M'Nab points out with great force the disadvantage under which research in vegetable physiology labours in this country, from the fact that neither at Dublin nor elsewhere is there a physiological laboratory in connection with a botanical garden, a conjunction always necessary for the carrying out of original research. Physiological botany may, indeed, be said to be comparatively at a standstill in this country on this account. Some time ago, the idea was mooted of adding a laboratory to the herbarium at Kew, but, from some inexplicable cause, the project was abandoned.



Calepteryx Virgo.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Destroying Insects in Frosty Weather.—It is generally thought that a severe winter is destructive to insect life, and so it probably is to some extent; but by far the greater number of our worst garden pests get sufficiently deep down in the earth to be out of the reach of frost. There is, however, a means of effectually dealing with such as have taken up their winter quarters in uncropped ground. On a hard frosty day let it be broken up with a pick to the depth to which it is frozen, turning the lumps up as large and rough as possible, so as to be quite open, and thereby expose the under surface still further to the influence of frost. This will not only destroy thousands of slugs, snails, wireworms, and the larvæ of similar pests, but it will, at the same time, aerate and pulverise the ground to a depth that cannot be reached by any other means, thereby improving its condition for cropping.

Manuring—Use of Salt.—There is nothing in a garden that partakes more of the penny-wise principle than attempting to grow vegetables on land insufficiently manured. The amount of manure used by market gardeners, who are not likely to make mistakes in this matter, is almost incredible. On well manured ground vegetables grow quicker, and are much more tender and juicy than when produced on poor land. It therefore becomes a question with the amateur what manures he is to use; if he is so situated as to have enough horse, cow, or pig manure, without purchasing, these will, in a great measure supply all his wants; if, on the other hand, he has to purchase, I should advise him to use some proportion of light manures, of which refuse salt is an excellent fertiliser, and is especially to be recommended for dry hot soils, correcting, as it does, to some extent their aridity by the moisture which it retains in the soil. It constitutes a suitable change for land that has received heavy dressings of stable-dung for a lengthened period. It should be applied during the winter months—the earlier the better, as it thereby gets time to dissolve, and thus becomes dispersed more evenly through the soil, rendering the land in better condition for cropping than it otherwise would be, as, if the salt lies together in any considerable quantities, it would destroy such newly-sprouting seeds as came in contact with it. From half to three-fourths of a pound per square yard is a good dressing, and the latter quantity should not be exceeded. It must not be used within a yard or so of Box edgings, or it will be liable to injure the Box.

Improving the Soil of Suburban Gardens.—The innumerable small and middle-sized gardens in the neighbourhood of large towns are often deficient in two important matters, one of which is an insufficiency of soil, which generally gets buried by cold unfertile clay, taken out of the foundations of buildings, and which, instead of being put under the surface soil, by removing the latter to admit of the work being done properly, is cast on the top or mixed with it; again, where the land is naturally heavy and retentive, it may be improved by mixing it with road grit or scrapings, or anything of a similar character that can be obtained cheap. A mistaken notion prevails, that nothing will improve such soils except good loam, and where that can be had cheaply by all means use it; but, where it cannot be got, anything of a character similar to the above will be found of great assistance. The other unfavourable condition to which many small gardens are subject is the presence of stagnant water, owing to an insufficiency of drainage. This is particularly the case in heavy soils, and for a kitchen garden, where the production of early vegetables depends, in a great measure, upon the ground being dry and warm, requires the drains to be much closer than is necessary for some purposes. In a garden the drains should not be farther apart than 15 feet; the depth to drain is another important consideration, varying, as it does, with the character of the soil. Three feet may be taken as a good average depth; a 2-inch pipe will be found large enough to carry off the water, which it will generally do better than such as are larger. When laid, place on the top of the pipe a foot in depth of any material in the shape of brick rubbish or refuse from the greenhouse fires. Such drains should always, as far as possible, run straight down hill, not, as was once the practice, diagonally. Amateurs having insufficiently drained gardens, are often deterred from commencing such operations under the impression that they are costly; such, however, is not the case.

Frozen Vegetables.—Cauliflower plants in frames, and under hand-lights, especially the latter, should be carefully shaded from the sun, or they will be much more likely to be killed by it than by frost; old mats that are too far worn to be of use in other ways will answer the purpose for covering the lights, and stable litter will do for the hand-lights, around which nothing is so good as Spruce branches stuck in the ground sufficiently firm not to be removed by wind. Lettuce should be treated in a similar manner, both in frames and under walls; in the latter situation, boards laid on their edge

slanting over, but not so as to touch the plants, and a good sprinkling of Spruce branches stuck in over all will be found to be useful; a few of the latter stuck amongst spring Cabbages will also cost little labour, and will frequently prevent the crop from being much injured. Attention to these and similar small matters constitutes the difference in gardening between successful and indifferent results. Should frost again set in, see that Potatoes, Beet, and Carrots, in stores are not frozen; dry litter or straw is the best material with which to cover them. Now is a good time to procure and prepare Pea sticks, and also those wanted for Runner Beans; by doing this work thus early, time is saved later on, when it is required more directly in attending to other matters.

Early Cucumbers.—Where means exist of growing early Cucumbers, either in a plant stove or heated pit, in which a temperature of 60° can be maintained at night, it is not a bad practice to sow a few seeds three different times during the month, as, if anything happens to the earliest sown plants, there are others to fall back upon. They are much the best sown singly in small pots, as by this method there is no mutilation of the roots by dividing the plants when re-potting. Put a small bit of flaky leaf soil or fibrous loam in the bottom of each pot; this will be drainage enough for the short time during which the plants remain in pots before being removed. Ordinary loam, with one-fourth of sifted leaf mould and a little sand, will be suitable material in which to sow the seed, which should not be covered more than half an inch, or fill the pots more than two-thirds full of soil at the time of sowing; this will leave room to add more when the plants have attained a few inches in height, and will induce them to throw out roots up the stem, which tend much to strengthen them. For ordinary purposes, few sorts equal the Telegraph, where it can be had true. It is an abundant and continuous bearer, but so free is it that, if the fruits are not well thinned, the plants will soon exhaust themselves with overbearing.

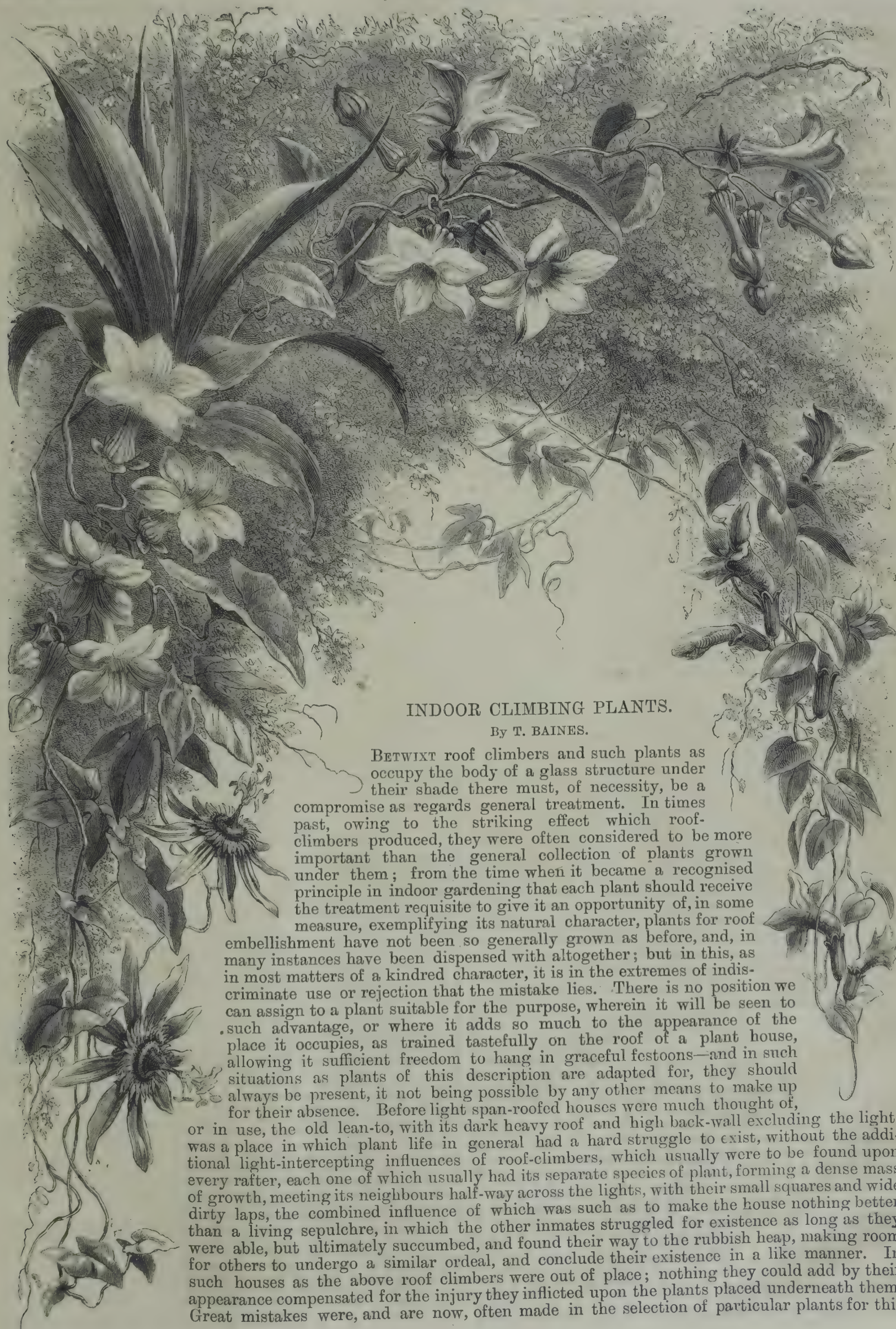
The Greenhouse.—Place in heat Hyacinths, Narcissus, and Crocuses, so as to bring them into flower, but see that they are well supplied with roots before being thus excited, for upon this, in a great measure, depends their ability to flower strongly. Keep them close to the glass, or they will bloom weakly and have a poor appearance. Care, so far as possible, should be taken that the frost does not reach anything that it will injure in either pits or frames, such as bedding plants or general greenhouse stock; but if it should happen that, through an insufficiency of heating power or an extraordinary severe night, anything should get frozen, the first thing to do should be to get up the heat a few degrees above the freezing point, closely shade the plants, and then syringe them freely overhead with cold water, keeping them as dark as possible for a few days. This mitigates the effects of frost, and, with some things, is effectual if they have not been too much frozen or not in a very luxuriant state of growth, which latter naturally tends to make all plants more susceptible to injury from too low a temperature than when less vigorous.

Exhibition Stands for Cut Flowers.—The following is the standard adopted by the Royal Horticultural Society for the stands in which cut flowers are staged at its exhibitions. Such stands should be painted green, or covered with green baize:

			Length.	Breadth.
48 Dahlias . . .	2 stands . . .	4 ft. 0 in. . . .	1 ft. 6 in.	
36 " . . .	3 " . . .	2 " 0 "	1 " 6 "	
24 " . . .	1 stand . . .	4 " 0 "	1 " 6 "	
12 " . . .	1 " . . .	2 " 0 "	1 " 6 "	
24 Gladioli . . .	2 stands . . .	3 " 0 "	2 " 0 "	
12 " . . .	1 stand . . .	3 " 0 "	2 " 0 "	
24 Asters . . .	1 " . . .	2 " 6 "	1 " 6 "	

Height of stand to be 6 inches behind and 4 inches in front. Stands for cut Roses and Hollyhocks to be of the same size and height as the foregoing.

The Results of the Late Severe Weather.—Now that a change in the weather has taken place, some estimate may be formed of the damage (if any) done by the late severe frost. On the night of the 29th ult. the thermometer here fell to 8°, or 24° of frost, which is the lowest temperature we have experienced since 1870. Fortunately, the covering of snow—assisted in some instances, where necessary, by other materials—has, as far as can be judged at present, kept things fairly safe. Even Broccoli, that rarely survives when the thermometer falls below 10°, seems to have passed through the ordeal unscathed. Rain commenced falling in the evening of the 1st inst.; but it froze as fast as it fell, and, on the morning of the 2nd, every place, walk, road, and street, was one complete mass of ice, and locomotion, except on skates, was a work of both danger and difficulty: since then the thaw has been exceedingly rapid, and the snow and ice are fast disappearing.—E. HOBDAV, Ramsey Abbey.



INDOOR CLIMBING PLANTS.

By T. BAINES.

BETWIXT roof climbers and such plants as occupy the body of a glass structure under their shade there must, of necessity, be a compromise as regards general treatment. In times past, owing to the striking effect which roof-climbers produced, they were often considered to be more important than the general collection of plants grown under them; from the time when it became a recognised principle in indoor gardening that each plant should receive the treatment requisite to give it an opportunity of, in some measure, exemplifying its natural character, plants for roof embellishment have not been so generally grown as before, and, in many instances have been dispensed with altogether; but in this, as in most matters of a kindred character, it is in the extremes of indiscriminate use or rejection that the mistake lies. There is no position we can assign to a plant suitable for the purpose, wherein it will be seen to such advantage, or where it adds so much to the appearance of the place it occupies, as trained tastefully on the roof of a plant house, allowing it sufficient freedom to hang in graceful festoons—and in such situations as plants of this description are adapted for, they should always be present, it not being possible by any other means to make up for their absence. Before light span-roofed houses were much thought of, or in use, the old lean-to, with its dark heavy roof and high back-wall excluding the light, was a place in which plant life in general had a hard struggle to exist, without the additional light-intercepting influences of roof-climbers, which usually were to be found upon every rafter, each one of which usually had its separate species of plant, forming a dense mass of growth, meeting its neighbours half-way across the lights, with their small squares and wide dirty laps, the combined influence of which was such as to make the house nothing better than a living sepulchre, in which the other inmates struggled for existence as long as they were able, but ultimately succumbed, and found their way to the rubbish heap, making room for others to undergo a similar ordeal, and conclude their existence in a like manner. In such houses as the above roof climbers were out of place; nothing they could add by their appearance compensated for the injury they inflicted upon the plants placed underneath them. Great mistakes were, and are now, often made in the selection of particular plants for this

roof drapery—large heavy-leaved subjects, such as *Passiflora quadrangularis* being employed (in stoves with not much light to begin with)—fine in itself, undoubtedly, but, in addition to its vigorous growth, possessing foliage of such size as to darken everything underneath it. It should always be remembered that the great majority of the different plants we grow in our stoves and temperate plant-houses are indigenous to countries where they receive much more light than this country affords, without taking into account the light-excluding and absorbing influences of the best constructed modern plant-houses. Even in the case of such plants as occupy our stoves, which, in their native habitats, are continuously under the shade of overhanging evergreen arborescent vegetable life, the light they receive in a state of Nature is quite different from what we can give them in our cloudy atmosphere; a condition further aggravated by the comparatively small amount of fresh air that plants living in a glass erection can receive, especially where an artificial high temperature has to be kept up by the use of fire heat, to the necessary exclusion of air. It then becomes a question where plants should be employed for the purposes of roof drapery and where they should be omitted, as also what plants to select for the purpose. In ordinary houses devoted to the growth of greenhouse subjects, hard or soft-wooded, either as permanently occupying such houses or in preparation for removal to conservatories, corridors, or similar places, the plants require all the light they can get; consequently, nothing in the shape of roof climbers should ever be allowed, especially where any attempt is made to grow the plants up to the standard generally required at the present day. If climbers are allowed to grow in such a case as this, they should be used sparingly, and they should be such as will not grow too rampant, be planted at a considerable distance apart, and kept well within bounds. The places where these roof-plants are most appropriate, or rather indispensable, are in houses where a considerable number of the occupants are planted out with a view to produce, as far as possible, natural effects, and in glass-covered corridors. A great number of the plants only remain in such structures as these whilst in flower, and in this state most things do not suffer to any appreciable extent, if not kept too long or too much crowded; this is consequent upon the comparatively little or no leaf-growth that takes place whilst the plants are flowering; the different subjects that are usually planted out in the conservatory are generally such as will not receive injury from partial shade, such, for instance, as Camellias, which rather enjoy it in moderation whilst making their growth; in houses, also, where most of the different subjects grown are planted out with a view to, as far as possible, produce a natural effect; and, to secure such, it is necessary to keep them at a considerable distance apart; here roof-drapery is indispensable, and can be used to the best advantage. Having considered the situations where these descriptions of plants can be best employed, it will not be out of place to indicate such as are best adapted for the different situations, in large or small houses, with difference in temperature, soil, moisture, &c., required by each. First as to those which require a greenhouse temperature, and are suitable for a cool conservatory or where there is little more heat kept up than will maintain flowering plants through the winter in good condition. Here it may be observed, that many of the best and most suitable are such as do not possess naturally a twining habit, and, consequently, cannot attach themselves to wires or other contrivances for their support.

Cool Conservatory Climbers.

Tacsonia Van Volxemii.—As a plant for roof decoration, which will grow freely, and which can also be kept in moderate bounds without using the knife to such an extent as to interfere with its flowering, there are few, if any, plants that surpass this *Tacsonia*; it is a profuse bloomer, its finely-coloured crimson flowers literally hanging in wreaths for months together; the shoots should be allowed to hang down for a yard or two, according to the height at command. Grown in this manner nothing can be finer; it requires a fair amount of root-room, in good sandy loam, well drained, with an occasional application of liquid manure, through the growing season and in the spring the removal of an inch or two of the surface-soil, adding some new, well-enriched with thoroughly rotten manure. After the flower-

ing season is over it may be cut in as far as is deemed necessary for the space at command, and the nature of the situation it occupies.

T. sanguinea is another fine plant much after the general habit of the last.

Plumbago capensis.—A plant totally different in habit from the foregoing; a good free grower and bloomer, its flowers, pale blue, are produced in bunches. This forms an excellent contrast to the above; it is, like them, a comparatively clean plant, not being so subject to insects as some others, but, to grow it well, it must be encouraged by the application of liquid manure, and the yearly addition of fresh surface-soil, otherwise its gets weak, and makes comparatively poor flowers. It is also most suitable for a back wall, or training round a pillar.

Lapageria rosea.—This is now well known for the quantities of rosy-crimson bell-shaped flowers it produces when in good condition; it is a plant of moderate growth, that likes a good, rich, sandy loam, well drained, on account of the liberal supply of water it requires when in full growth. It is from the Chilian Andes, found at a considerable elevation, and requires nothing more than protection from frost, but the young shoots are impatient of the direct action of the sun, whilst the leaves are not fully developed, consequently, it should in this stage, have a little shade. The mistake which many at first made in the cultivation of this *Lapageria*, was in planting it out too soon; a small ordinary trade-sized plant, takes a couple of years to get into a strong state, and, during this time it should be kept in a pot, moving it on into a larger size as the roots require it, and when it gets strong and has plenty of roots to lay hold of the soil in which it is turned out at once, it should be planted out, otherwise, the too great body of earth becomes sour before the roots exist in sufficient quantities to freely extend all through it.

Lapageria alba is an exact counterpart of the red variety in every way, except the colour of the flower, which is pure white, and one of the very finest plants ever introduced into the country. Both varieties make fine pillar plants, or to form an arch over a conservatory path, in which positions their young growth is farther from the roof glass, and not so likely to receive injury from the sun whilst in a tender state.

Tecoma capensis is another good climber of moderate growth, but not too rampant. It produces its yellow flowers in bunches, from shoots of moderate strength. It is from the Cape, and succeeds well in sandy loam. It does not require, when once well established, so much assistance at the roots, in the shape of manure-water or rich soil, as some plants; its shoots being in a pendent form, well answering the purpose of relieving the objectionable appearance of bare rafters.

Mandevilla suaveolens.—A free-growing plant from Buenos Ayres, with highly-perfumed, white, trumpet-shaped flowers, produced in bunches from the points of the shoots. It is not so generally known or grown as it ought to be, requiring a considerable amount of room to fully develop itself; it needs a moderate amount of root-room, in good turfy sandy loam, assisted through the growing season with liquid manure. The plant is subject to red spider, to keep down which it should be well syringed two or three times a week through the season of growth; the flowers are fine for cutting.

Clematis indivisa.—This is a white-flowered plant, from New Zealand; it is a very free grower, and a most useful plant for the production of cut flowers, a consideration that should by no means be lost sight of, for if in these roof plants such are grown as will furnish in quantity flowers for cutting, it is an advantage. This is a strong grower, and is suitable for a large house; where it can have space to run, it will grow in any kind of soil, and is not subject to insects. The plant will bear a free use of the knife after flowering.

Passifloras are general favourites, and there are several that can be used as cool conservatory roof plants, amongst which may especially be mentioned the free-flowering light-coloured *P. onychina*, the white *P. Hartwegiana*, and *P. Imperatrice Eugenie*, white sepals, and pale pink petals. These are plants of moderate growth, free bloomers, and, from the pendulous habit of the flowering shoots, are well adapted for the purposes under consideration.

Acacia pubescens, from New South Wales, and **A. lophantha**, from New Holland, are fitting subjects for the roof of a conservatory, but are better adapted for a place at the end, especially if such should be a dead wall, as, abutting on a dwelling-house, in such a situation, they produce a fine effect when they reach the roof and are allowed to extend a little. The above *Acacias* are very distinct in habit; the latter (*A. lophantha*) is a fine plant for cutting; the leaves are almost Fern-like, stand well when cut, and are especially adapted for mixing with cut flowers for the decoration of large vases, for which purpose this plant cannot be surpassed.

Hovea Celsi is a native of New Holland, and although seldom used for the purpose, is a beautiful object in flower on a conservatory pillar or a light corner, its deep blue flowers being so distinct; but

where it is the intention to place this *Hovea* in such a situation, the plant must be first grown to a moderate size before turning out in the open border, so as to have it furnished with a fair amount of roots previously.

Cassia corymbosa, from Buenos Ayres, is also a plant very seldom seen planted out in a conservatory, but for covering a wall or pillar it has few equals. Those who have only seen this *Cassia* grown as a pot specimen cannot form the slightest idea of what it is when allowed sufficient root and head room. So treated, it blooms for six months in the year, its beautiful green healthy foliage setting off the bright yellow flowers to the best advantage.

Clanthus magnificus.—This free-flowering form of the Glory Pea makes an excellent pillar-plant; it is very attractive and distinct, not requiring a great deal of root room, but must, like the other species of this family, be regularly syringed to keep down red spider.

The above are a few of the best plants that can possibly be used for furnishing the roof and pillars of a cool conservatory; many others are often to be met with in such situations. Some very unsuitable, either through their weak habit of growth and insignificant appearance, or the opposite defect of being so rampant as to smother everything under them unless the knife is kept so continuously in use as not to allow their ever exhibiting their true character; it also often happens that plants are recommended as greenhouse climbers that require an intermediate temperature, and do not succeed for want of sufficient heat. A few of the best for an intermediate house I will name and endeavour to describe.

Climbers for an Intermediate House.

Bougainvillea glabra stands unequalled as a roof-plant, or even if kept within the bounds of a pillar, but the temperature should not in the winter fall below 46° or, if it can be kept to that, 50°. This plant will repay the grower better than any other with which I am acquainted; it is a vigorous grower, and should have a fair amount of root room; the points of every shoot it makes will become clothed for a foot or more in length with its lovely mauve-coloured bracts, continuing to open uninterruptedly a succession of flowers for months during the summer and autumn; it will grow in either peat or loam, but requires liberal feeding with manure-water.

Abutilon Duc de Malakoff is a strong growing plant, well adapted for a similar temperature, its distinct bell-shaped flowers contrasting well with anything else. The beautiful white variety, *Boule de Neige*, is also a most desirable plant for a pillar, flowering at almost every leaf it forms, and, if a temperature of 50° is maintained in the night through the winter, it will bloom almost continuously.

Habrothamnus elegans is a native of Mexico, and is another useful free-flowering plant, producing its purple flowers in terminal bunches, at the extremity of almost every shoot nearly all the year round, and if kept a little warm through the winter will continue blooming; it succeeds best in loam.

Clerodendron Balfourii is one of the freest growing and equally free flowering plants we possess, little subject to the attacks of insects, but will do the best grown in a large pot and kept at the warmest end of the house; it does not like a lower temperature than 48° or 50°, and in the winter it should have water withheld so as to induce the leaves to ripen and fall off, receiving only a little at long intervals, until it shows signs of the buds swelling in the spring, when the ball should be soaked by steeping it for several hours in a vessel full of tepid water, until it is thoroughly moistened, when it will grow and flower from every joint, after which it may be, as far as desirable, reduced with a knife.

Stephanotis floribunda is a universal favourite and will succeed well with similar treatment as far as being grown in a pot goes, but it will not require so much root-room as the *Clerodendron*; neither should it have its roots interfered with much, for when it once gets large enough to occupy a pot 15 or 18 inches in diameter, it will not require to be moved for several years, further than seeing that the drainage is right; give it manure-water once a week during the growing season; the reason for not turning this plant out into the open border in a situation where the temperature is not kept higher than above indicated during the winter is, that if the roots were placed in a large body of soil there would be a difficulty in keeping it dry enough to preserve them, especially if in soil partially occupied by other plants which would not bear this dry treatment; this plant, in such a situation, only requires a little water through the winter when the leaves show signs of shrivelling.

Jasminum Duchesse d'Orleans.—A double white variety, very large and full; is a plant well worth a place here, but should also be grown in a pot, in sandy loam; its fragrant flowers are most useful for cutting.

Luculia gratissima from Nepal.—This old but beautiful free-flowering plant is one of the finest to occupy a corner of the inter-

mediate house or on a back wall, it well deserves a place, producing, as it does, for a considerable time its large bunches of sweet-scented pink-coloured flowers.

Climbers for a Stove.

In large stoves, or where a conservatory is kept up to a moderate stove temperature, say not usually lower than 55° in the night during winter, most stove climbers will do even better than where the temperature is correspondingly higher winter and summer, provided the plants are kept tolerably dry at the root when at rest. Many stove-climbers, when grown in a very hot house, especially if planted out, continue growing at such a rate as to appear not to get rest enough to induce a flowering disposition. In a winter temperature, such as above indicated, *Allamandas* will succeed well in pots, or, if planted out, the space devoted to their roots should be limited, or they are apt to get so strong as to completely smother everything near them. The roots should be for a time during the winter kept quite dry, and the shoots well cut in; they will bear a free use of the knife. The two varieties most suitable are *A. grandiflora* and *A. Chelsoni*, which are the freest flowerers and smallest-leaved sorts; they succeed the best in good loam.

Hexacentris mysorensis, from Mysore, is a fine plant for a roof-climber, producing freely its gorgeous racemes of red and yellow flowers. It is not so strong a grower as the *Allamandas*, and is much more elegant in habit.

Combretum purpureum, from Madagascar, is a moderate-growing plant, producing very remarkable reddish-purple flowers. It does the best in a large pot, or, if planted out in a confined space, where the roots of the more vigorous climbers can be excluded, otherwise they will impoverish the soil of this and similar moderate-growing subjects, so as to give them little chance.

Clerodendron splendens is a moderate-sized red-flowered plant, from Sierra Leone, a good, but not over vigorous grower, requiring similar treatment as to root room to the *Combretum*, and, like it, is more suitable for clothing a pillar than making much way on the roof; both plants do well in sandy loam, and need little use of the knife.

Stephanotis must also have a place here, and will do well planted out in a moderately confined space, keeping it dry at the roots during the season of rest, and cutting it as far as requisite after flowering.

Passiflora quadrangularis.—This magnificent and singular flowered plant is a native of Madagascar, and is most suitable for covering a back wall, or, if allowed a place on the roof, it should not have too much root room, or it becomes almost unmanageable; it may be cut in moderately after flowering; it does well in loam, which, with most of these climbers, especially such as are vigorous growers, induces a freer flowering disposition than peat. The fine crimson *P. kermesina* is one of the best for a place here, it will run a considerable distance if allowed space, and should be kept in bounds by a free use of the knife, and not allowed too much root room.

P. Decaisneana is also a good variety, and well worth a place, treating it similarly to the last.

Ipomoea Horsfalliae, is a good free-flowering plant, not so strong or rambling a grower as some, and is most suitable for a pot, or confined space if planted out; producing its rosy-coloured flowers in bunches for a long time in succession.

Of *Dipladenias*, all fine climbers, *amabilis*, *Brearleyana*, *insignis*, and *Williamsii*, are the best, and all deserve a place in even the most select collection of plants, but if planted out, the space allotted to their roots should not be too large, for if the soil ever gets too wet it will rot them to their certain destruction; they are the most suitable for pot culture. The three first-named are all different shades of red and crimson, the latter, *Williamsii*, is a splendid pale blush, with deep rose in the centre; all are garden hybrids, and require good fibrous peat, with a liberal admixture of sand. If a singular-looking flower is wanted, *Aristolochia gigas*, or *A. ornithocephala*—the former from Guatemala, the latter from Brazil, may be grown; both are very strong free-growing plants, and do well in a pot in loamy soil. They produce their large, most singular flowers very freely, from the young shoots during the summer, and bear cutting well back afterwards, but from their free growth they exhaust the soil very soon, consequently they require liberal feeding with liquid manure, and the soil partially removed each season before they commence growth. *Bougainvillea glabra*, and the still higher coloured, *B. spectabilis*, should one or both find a place here, drying them off thoroughly after they have made their season's growth, and cutting in as required before they start in the spring. The last named variety is the most suitable for a very large house on account of the room it occupies.

Euphorbia jacquiniæflora, from Mexico, is a most useful and continuous winter flowering plant, and, for a wall in a warm stove,

there is nothing more appropriate, or has a better appearance; in such a situation it is most beautiful, planted out in a limited space in good loam; it must never be over-watered, especially after being cut back after it has bloomed, or its roots will be almost sure to rot, after which it will never recover. The foregoing comprise a selection for the different temperatures indicated, and cannot fail to give satisfaction; but, in commencing their cultivation, care should be taken that they are free from the worst species of insects, such as mealy bug, white and brown scale, and also that no affected plants are placed so near them as to admit of their getting infested with these pests, or the work entailed will be endless, and, in addition, every plant on which these insects will live that is placed under roof-plants so affected, is certain to catch the insects from them; this, in particular, applies to the plants recommended for the cool conservatory, if the plants here on the roof get affected with that worst of all insects, white scale, there is no remedy but cutting all the branches away, and repeatedly scrubbing the stems with a strong solution of some insecticide that will destroy the insect, which must be thoroughly exterminated before the headed-down plants break, as the young growth will not stand the mixture strong enough to kill the insects. In the planting and after-management of roof-climbers there are two things that should always be observed, never to plant too many subjects to overcrowd the house, or to allow the whole area of the roof to be covered as is sometimes seen; this not only defeats the object in view, which is to embellish the house, not to make it an interminable thicket of running shoots, which destroy everything under them, and ultimately have to be cut out. The training should be regularly attended to as required, not allowing the plants to become entangled with one another or in themselves, and the thinning out and general use of the knife should also be continuous, so far as possible, without interfering with the flowering of the plants; by such means the effect produced will be more natural in appearance than it otherwise would be.

WAITING FOR SPRING.

THOU of the sunny head,
With Lilies garlanded,
And bosom fairer than the blown sea-foam;
O Spring, in what waste desert dost thou stay,
Whilst leaves await thy presence to unfold?
The branches of the Lime with frost are gray,
And all imprisoned is the Crocus' gold.
Come, sweet enchantress, come!

Arise, and bring with thee
The rathe bud for the tree,
The healing sunshine for the trampled Grass;
Loose tendrils for the boughs which bless the eaves,
And shield the swallows in the rainy hours,
The pendent flames which the Laburnum heaves,
And faint scents for the wind-stirred Lilac flowers.
Enchantress, breathe and pass!

The larks shall sing again,
Between the sun and rain,
The brown bee through the flowered pastures roam,
There shall be music in the frozen woods
A gurgling carol in the rushing brook,
An odour in the half-unbosomed buds,
And dancing Foxgloves in each forest nook:
Then come, enchantress, come!

—Chambers's Journal.

How to Treat Imported Bulbs of *Gloriosa superba*.—Kindly inform me how and when to plant bulbs of *Gloriosa superba* sent to me from India? —HIMALAYA. [Imported bulbs or tubers of *Gloriosa superba* should be kept perfectly at rest in pots filled with parched dry soil or sand until March or April; then plant each tuber in an 8, 10, or 12-inch pot, according to size, in a compost consisting of three parts friable turfy loam and one of turfy peat, to which a little leaf mould and sand have been added. Cover the bulbs from 1 to 2 inches deep, and place them in the warmest part of a stove; keep them nearly dry until they begin to grow, after which water as required, but at first not oftener than once on alternate days. Increase the root temperature by partially plunging the pots (if practical) in some warm material until vigorous growth has been induced; then gradually remove them from bottom-heat, and encourage growth by exposure to full light and a moist genial atmosphere; and this treatment should be continued until they have made their growth and have begun to bloom. When done blooming, they should have a perfectly dry period of warm rest in the pots until they are started again into growth, which should be slowly at first, under a high temperature in a moist warm stove; but when they have made their growth, they should be bloomed in a drier atmosphere. To avoid injury from undue contact with moisture, the tubers should not be broken, cut, or bruised when planted. Being somewhat difficult to re-pot or shift during growth, each tuber should be at once placed in the pot in which it is to be flowered, in the soil named, with proportionate, not excessive drainage.]

THE KITCHEN GARDEN.

COBBETT'S CORN.

MR. WILLIAM COBBETT, a son of the celebrated William Cobbett, of political fame, when travelling in the United States, during his father's lifetime, sent home some cobs of the Indian Corn or Maize, so abundant in that country. The elder Cobbett at once concluded that he had here found the antidote for the Potato "fever," and a substitute for that vegetable, to which he had conceived such a violent antipathy. Cobbett's Corn was advertised, proclaimed, and applauded all over the kingdom, and thousands of enthusiasts bought seed of it and grew it, but somehow the crops failed to ripen properly, and much disappointment followed. The taste for the Potato increased, and the demand for the Corn died out. The present Mr. William Cobbett has long since discontinued growing that kind of Corn, which he found ill suited for cultivation in a climate where, as in England, the summers are short and uncertain; but he still entertains the belief that there is a kind of Indian Corn or Maize that would ripen here under ordinary culture, and that he now possesses the stock of such a variety, I am, from personal observation, assured. During the past summer in an adjoining garden, he has grown a capital crop of this particular kind, the "Improved Cobbett's Corn," and, although not sown earlier than the middle of April, the crop had ripened and was harvested before the end of September—many of the best cobs having been gathered even a few weeks earlier. This was grown in ordinary garden soil, prepared by digging and manuring as for any ordinary garden crop, and with after cultivation of the simplest kind. The best way to grow it appears to be to have the soil thrown up into ridges, of which the width apart depends on the method of after-cultivation to be adopted, whether by hand or by the plough. Mr. Cobbett informs me that in the States it is the practice to cultivate it in hills 4 feet apart each way, thus leaving, whilst the plant is yet young, ample space to work the plough amongst them for earthing up. Mr. Cobbett, although his crop was cultivated by hand labour, grew it in rows 4 feet apart, but I was satisfied that equally as good a crop could have been produced at 30 inches between the rows, as that would give ample space for earth to be drawn to the roots by hand-labour. If the crop be grown largely and the plough be required to cultivate the soil between the rows, not less than 4 feet space should be allowed from row to row, and after the earthing up is performed, a row of Swede or white Turnips might be sown in each intermediate space, and thus the ground would be utilised to the fullest extent. To prepare for the reception of the seed-corn the soil should be thrown into ridges, and then be slightly flattened with a light roller; the seed is then dibbled into the centre of each ridge in holes about 4 inches apart and 3 inches in depth. It soon germinates, and, as it throws up a shoot that is sweet and tender like that of a Pea, it is eagerly sought for by birds, who will attack it vigorously unless they be kept at a safe distance; as soon, however, as it is well through the ground it is safe. The course of treatment required during growth is simple enough. If in a small patch, a good flat hoeing, followed, when the plants are 12 inches in height, by a good earthing up, suffices until the Corn is ready for the harvest. If grown largely in the open field, then the liberal use of the horse hoe must be succeeded by the earthing plough, the object of this earthing up being to give the plants the requisite support in case of rough winds and storms prevailing. As we usually get the strongest gales from the south-west, it is well, in sowing, to have the rows running from that point of the compass, as the wind, being at liberty to sweep along between the lines, is productive of much less mischief than if the rows be at right angles to the direction of the storm. Grown in good soil, the new Cobbett's Corn does not exceed 4 feet in height, and it is far from being so coarse-growing a variety as we have hitherto been familiar with. It is one of the peculiar features of the Maize crop that it can be harvested at any time, as, whilst still standing, it suffers neither from frost nor rain. Each cob is furnished by Nature with an external leafy covering that effectually protects the Corn from moisture. The covering is of a stout fibry texture, and, as the weather becomes moist it contracts itself closely around the Corn, and keeps it quite dry; still, should it get at times a little damp, it soon dries again when fair weather ensues, so that no harm is done. Probably, at no time could Maize be better harvested than in dry frosty weather, but the question of harvesting would be, of necessity, a question of convenience. A stalk will produce from four to six cobs, the finest being at the bottom. A good cob contains about 240 corns, which, when ripe, are of a rich golden-yellow hue. I found, as a rule, that the best cobs grown by Mr. Cobbett had eight rows of Corn, thirty in a row, laid together in the most perfect order, and, although much finer cobs may be grown, certainly none could be more handsome. To preserve them clean and bright for a considerable period, it is

desirable to strip off the outer leafage, leaving only the inner one, and, if this be tied round at the top of the cob, it will keep it fresh and clean for a long time. It appears to be the rule to pull the cobs whilst the straw is standing, after which it is cut close to the ground and carted away. The straw is useful as a winter covering, as, owing to its stout fibry texture, it does not decay so speedily as ordinary straw. One characteristic which should not be overlooked is that the plant throws up suckers from its base. These are not fruitful, and should be cut clean away before the final earthing up is given, otherwise the crop will suffer. The uses to which this Corn may be put are many and various, and it is one of the most nutritious of all articles of diet; it is evident that, if successfully cultivated in this country, its proving a profitable article of culture must mainly depend upon its mode of manufacture. There are machines for "dis-cobing" the corn, and any mill that would grind Peas or Wheat should also as effectually grind it. The Corn is with us largely used as food for poultry and for horses, both whole and in a crushed state; it enters largely into the composition of bread, as is evidenced when the bread crumbles instead of being cut clean by the knife. The flour of this Corn forms a delicious diet for infants and for invalids; it makes puddings and blanc mange, and, in the hands of a clever housewife, will make us sweet crisp cakes. Whether or not it will prove a paying crop depends mainly on the cost of cultivation. A. D.

* GROWING POTATOES FOR EXHIBITION.

IN growing Potatoes for exhibition, one of the first considerations is soil. Some soils will always grow Potatoes well, such, for example, as a deep friable sandy-black loam, that is either naturally or artificially obtained, but then such a soil as this is far from common, and therefore the cultivator has to make the best of that of which his garden consists. If your correspondent who wants information about growing Potatoes for exhibition has a soil that is naturally heavy, he will do well to work into it as speedily as possible a liberal dressing of long fresh stable manure, burying as much of the straw as possible. This should be dug in with a long tined fork, and the soil should be as much broken as possible. After resting a few weeks, let the ground be marked out with a line in lengths of 3 feet in width, and each length should be thrown into a ridge, the centre spit being turned over first, and the two side spits thrown up on to it. In this state it should lay until planting time, just prior to which, however, it will be well to add a dressing a few inches in depth along each trench, of either rotten leaf soil or of vegetable refuse from the rubbish heap. This should be well forked into the trench, in order that there may be good depth of well-worked soil below the seed tubers. Still farther, a good dressing of slaked lime one half, soot one quarter, and guano one quarter, may be sown with advantage along each furrow, and be lightly pushed in when ready for planting. A shallow drill drawn with the hoe will be all the remaining preparation needed. Lime, newly slaked, and soot are important ingredients in the cultivation of show Potatoes, as they keep off wireworms and promote that smoothness and cleanness of skin so essential to a handsome Potatoe. If the soil be light, a good dressing of well-rotted manure should be worked into it in autumn, and in spring, just before planting, a dressing of lime (as just mentioned) should be applied all over the surface, and as planting proceeds this will be forked in, the lines in this case being, as before, not less than 3 feet apart. As to sets, preference should be given to such as weigh about 3 ounces each, and they should be selected early in spring, and be laid out singly either on shelves or in shallow boxes exposed to the light, so that when they break the shoots may be strong and healthy. Shortly before planting, and when the strongest eyes have pushed into growth, the whole of the sets should be gone over, and have all their eyes gouged out with a sharp knife, excepting always the strongest, as that alone is amply sufficient to produce a good crop, and the tubers will be larger than if three or four eyes are allowed to grow. As to planting, the second week in April is early enough. If the ground has been ridged it is simply necessary, as has been stated, to draw a shallow drill, place the sets firmly in it at intervals of about 15 inches, and then lightly and carefully cover them with the finest soil from the sides of the ridges to a depth of about 5 inches. Nothing more need be done until they are well through the ground, when the ridges between the rows should be again forked up, as it is only by constant working that a stiff stubborn soil can be brought into a good free tilth. Planting on the level light soil should be done in rows at the same intervals of 3 feet, using a fork to move the soil to a depth of about 6 inches. Thus a shallow trench is opened across at one end of the piece to be planted about 1½ feet from the edge, and a line being strained along it, the seed tubers are placed in it carefully, and the same width apart as before mentioned.

The soil is then carefully forked over on to these, and the forking is continued until another width of 3 feet is accomplished, when another line of sets should be planted as before, and so on until all are in the ground. Distinct kinds should be marked with a large label, to prevent any possible mistake. In both cases it is best to stir the soil around the haulm with a fork rather than with a hoe; the earthing up, which should be done twice (an interval of two weeks being allowed to elapse between each operation), should also be done with the fork. Beyond keeping the ground free from weeds, little else is required, and if the sorts selected are good, and the season favourable, good crops ought to be the result.—A. DEAN, *Bedfont*.

FRENCH BEAN FORCING AT BURGHLEY.

SOME of our great gardeners have remarked that they have French Beans and Grapes all the year round, but is that requisite? It is well known that, if these things are supplied daily, they become commonplace; whereas, if we are without them—say in both cases a couple of months—they are then not only something fresh, but are enjoyed far better. When I first began to crock pots for French Beans, we used to put half a dozen Beans in an 8-inch pot only half filled with compost, which consisted of old Mushroom-dung—and for very early forcing, I know of nothing better. At that time, however, glasshouses were not so plentiful as now; the Pine-stove and early Vineries were the only places available for such crops. Some short time since, I noticed, in a contemporary, that French Beans were earthed up (just because our grandfathers earthed them up, and for no other reason), as no roots ever pushed from the stem. But I have repeatedly seen them well rooted nearly to their first leaves. We have here a span-roof house, 60 feet long, divided in the middle; half is used for winter Cucumbers, and the other half for French Beans in winter, and both portions are used in summer for Melons, of which we want a succession all through the summer months. Our first lot of Beans was sown in 3-inch pots on the 11th of October, and the first dish was gathered November 25th and the usual practice is to have three successions; whenever the first is thrown away, another batch of fifty pots is sown, so that a full succession is always maintained. The general soil for them in winter is light turfy material enriched with rotten leaves. They are shifted from small pots just as the second leaf is showing, an operation in which they receive a slight check, which prevents them making too much growth and too few pods. They are placed at once on the shelves. When growth commences, I take out their points to make them stubby. They should also be surrounded with small spray, and one piece of matting should be put round each, to keep it in form. No manure-water should be used until the Beans are formed, when they should be well supplied with it. Respecting temperature, I never like to almost freeze my pots at night and parboil them during the day, but give them from 60° to 68° at night, and let the thermometer run up to 75° or 80° by sun-heat; and on every possible occasion give air, if only for an hour. French Beans are troublesome things to keep clear of red spider; but by syringing overhead daily, and keeping all about them moist, they will not give much trouble. The great variety of these Beans now in the market somewhat perplexes us; but of all that have come under my notice, Canadian Wonder is the best, and it is the only sort which I grow. But there is more than one variety sold under that name. By growing this Bean one is rewarded by fine straight pods 6 inches long, as green as Grass, perfectly tender, and of delicious flavour.—R. GILBERT, *in the Gardener*.

New Potato Disease.—A new Potato disease has made its appearance in Algeria within the last two years, and has totally destroyed two-thirds of the crops, and threatens to do even a larger amount of injury. Potatoes attacked by the pest are utterly worthless for any purpose whatever. No animal will eat them, and, on opening the tubers, it is found that they are honeycombed in the centre, and filled with a blackish matter that gives forth a very offensive odour. It is not the *Botrytis infestans* that is causing the damage, but a very minute insect of the *Lepidoptera* order, of which the history is little known. It is only supposed that the larvæ germinate in the roots of various vegetables. The small moth deposits its eggs upon the young shoots of the Potato the moment they appear above the ground. As soon as the eggs are hatched, the small caterpillar, as slender as horse-hair, penetrates into the stem, and works its way down into the tuber, the interior of which it eats away. The grub which works the mischief is unknown in Europe, and the name has been given to it of *Bryotropha solanella*. The "Journal of the Central Society of Horticulture of France" warns Potato-growers against planting Algerian Potatoes, for fear the disease may be introduced into France.

GARDENING FOR THE WEEK.

Kitchen Garden.

EVERY garden, where early vegetables are a desideratum, should be provided with a number of those cheap portable frames and lights of which many forms and designs are now met with; it is hardly necessary to particularise any special form, as they are all useful, from the old-fashioned hand-light to the more elaborate designs now frequently advertised; but, whatever shape they may assume, protection from the cold, and concentration of the sun's warmth, by means of glass, is their chief aim and object. I think, if I am not mistaken, Mr. Rivers was amongst the first to advocate the extended use of such glass frames; and his ground Vineries were, I believe, the first examples that were offered to the public. I suppose on any estate where a staff of carpenters is kept they could be manufactured without infringing anyone's patent. It does not require a great amount of skill to make a garden frame, and the most useful of them are, after all, only a handy modified form of the old garden frame. There is, I think, no question that the aid of glass in the shape of cheap portable frames, of various widths and lengths, is calculated to do as much for vegetable culture as it has done in another form, and is still doing, for fruit culture. The cultivator, moreover, who has a supply of those handy frames at this season stands in a far better position than the man who has nothing of the kind, and success is often quite as much a question of means and circumstances as of skill. In addition to the mere protection afforded by these frames, which is very considerable, they will be found very useful for forcing many things. Thus, a trench may be opened the width of a frame—and they may be obtained any width, 2 feet of hot dung and leaves placed in, and about 6 inches of light soil placed on the top, and a miniature hot-bed is formed without much expense, either in labour or materials, that is especially adapted to forwarding salading of all kinds, including Radishes, Lettuce, Mustard and Cress, &c. With a rather greater depth of soil, Potatoes or Cauliflowers may be successfully grown much earlier than they can be without having recourse to more elaborate, and consequently expensive, preparations. Excellent Asparagus might be forced, without disturbing the beds, from this time onwards throughout the spring, by placing a range of these handy light frames on each bed in succession. Some of the earth might be removed from the alleys, and the space filled up with warm dung and leaves, building it up to the top of the frames, matting up the lights, except on sunny days, till the heads were pushing through. In some places it may be advisable to plant two or three beds, especially for this kind of forcing, where the litter would not be objectionable; and, in such a case, if possible, the beds should run east and west; then, if lean-to frames were used, the full benefit would be obtained from the sun's warmth. Where there are the means of bringing forward Tomatoes very early under glass, either in pots or planting them out in a warm light house, if cuttings were not secured in the autumn (which is the best way), seeds may be sown and pushed on near the glass in heat; but, unless for the special object I have named, next month will be quite early enough to sow for general outdoor culture. Wherever there is likely to be a scarcity of either Cauliflower, Cabbage, or Lettuce plants, a small sowing in pans, of each might be made, and the pans placed near the glass, in a temperature of about 50°. So soon as the land is in a workable condition, the warmest border destined for early crops in the open air should be renewed, as much as possible, by adding fresh rich light soil, or thoroughly decayed dung, preparatory to cropping. There is nothing, however, gained by either planting or sowing when the land is not in a fit condition; therefore, however anxious we may be, to be up and doing, it will be better to wait a few days.—E. HOBDAV.

The Flower Garden and Pleasure Grounds.

While the weather remains in its present condition very little can be done in the open air in these departments, further than to furnish plants, of whose hardiness there may be any doubt, the necessary protection in the form of a slight covering of some sort, and mulching around the stem, &c., with dry litter. The present winter is proving itself by no means an ordinary one; on several occasions during the last week of December the temperature fell to within a few degrees of zero, and such depressions are found not unfrequently to prove injurious, and sometimes fatal to species which are generally regarded as quite hardy. Fortunately, however, for bulbs in any degree tender, as well as for Alpine and other herbaceous plants, they have had for some time the advantage of Nature's protection in the form of a few inches of snow, which should not, on any account, be removed. But this protection cannot, of course, extend to trees and evergreen shrubs, whose frozen foliage, &c., is daily, to some extent, thawed by the influence of an hour or two of winter sunshine; and it is to these alternate thawings and freezings that the injury

so frequently inflicted upon evergreens, &c., are to be ascribed. So, if not already done, let all plants occupying prominent positions, or specimens which can ill be spared, of such species as the *Arbutus* or Strawberry tree, *Aucubas* of various sorts, and *Daphnes*, *Desfontainea spinosa*, *Escallonias*, the *Laurus nobilis* or the Sweet Bay, and various kinds of *Yuccas*, and Asiatic species and varieties of the *Rhododendron*, new Coniferous trees of moderate dimensions, &c., be surrounded with a few stakes, on which to support a covering of mats or frigi domo; the latter always proving a very effective protection. While the frost continues so intense as it is at the present time, allow by all means the covering of snow to remain upon the roofs of pits and frames, containing Alpine and other half-hardy plants; but, as soon as a favourable change takes place in the weather, and the snow begins to melt rapidly, let it then be removed, at once, so as to prevent the drip from the melting snow saturating the soil in which the plants are growing. The time is now nearly at hand when the propagation of bedding plants should be commenced; but it may, at the same time, be advisable to defer such work for a time, or until a favourable change in the weather takes place. But, in the meantime, the preparation of materials for the formation of hot-beds, &c., should be at once attended to, such as incorporating tree leaves with stable-yard manure by frequently turning the same.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Orchids

During this month the demand for Orchid flowers, for the decoration of vases, ladies' hair, &c., is unusually great, and, therefore, such choice varieties as *Odontoglossum Bluntii*, *O. pulchellum*, *Cœlogyne cristata*, *Lælia albida*, *L. anceps*, *Angræcum sesquipedale*, *Phalænopsis grandiflora*, *Schilleriana*, and *amabilis*; and *Cattleya Trianae* should be grown in dozens. These are so often imported as to bring them within the reach of almost everybody. *Dendrobium heterocarpum* is one that should have a place in every collection, not on account of the beauty of its flowers so much as for its perfume. *Cattleya maxima* should be more common than it is, and, if grown in the Mexican-house, it is almost certain to do well; it requires little shade during summer, and will produce blooms late in autumn. *Dendrobium chrysanthum* should now be put in baskets or top dressed, as the case may require. It should also be supplied once a week with weak manure-water, and the young growths should be sprinkled on bright days with pure water. This species should be suspended at the warm end of the *Cattleya*-house until it has completed its growth, when it should be placed in a house to ripen, free from shade. Keep plants of *Disa grandiflora* well supplied with water after they have begun to grow; also *Odontoglossum Bluntii*, *O. Pescatori*, *Oncidium macranthum*, and *Masdevallia*, all of which should be well supplied with water, in order to keep the *Sphagnum Moss* in a free-growing state. The latter should be encouraged to cover the surface of the pots. Now is a good time to look over plants and to make a list of such as require re-potting. Great care will now be required in order to keep up a regular temperature, which should be allowed to fall a few degrees rather than rise; less moisture should also be used.—E. CULLEY.

Indoor Fruit Department.

Pot Vines.—Young Vines kept in small pots last summer for cutting back and growing into strong fruiting canes this season, should now receive attention. Cut them over at two eyes from the base, and apply some styptic to the wound, which may bleed when growth begins. When cut and dressed, turn them out of their pots and shake most of the old soil from their roots. Have a corresponding number of 6-inch pots cleaned and drained, and into these pot the roots singly, using a free open pure loam, mixed with a little horse droppings. Give sufficient watering to damp the whole of the soil, and plunge the pots to the rim in a hot-bed where a bottom-heat of 85° exists. They may be plunged as closely together as the pots will stand, and, where a suitable place cannot be obtained for their accommodation in a house, a hot-bed, covered with a frame, will form a suitable place in which to keep them during the first stages of their growth. Another equally successful mode is to cut and dress the Vines, and plunge them, without disturbing the roots, in the soil in which they grew last year, retaining them in this way until they have made a young growth of 2½ or 3 feet in length, when they may be shifted into larger pots without breaking the ball. In this way they grow more freely when young, but they do not root so readily into fresh soil as those which had their roots disentangled. Such Vines are generally grown for starting into growth, with the view of fruiting in October or November, and the earlier they are started the earlier will the fruit be ripened, and thereby have the advantage of a longer rest before the operation is again repeated. Where it is desirable to start pot Vines about the time stated, it is impossible to get them of a satisfactory kind, unless

they have been cut back. Such Vines start into growth more quickly, grow faster, and ripen their wood sooner than one-year-old canes do. Where, however, it is not necessary to start them into growth before January and afterwards, one-year-old canes are as suitable as such as have been cut back, as it does not take so much trouble to attend to the growth of the former as the latter. If plunged in a dry place, a damping overhead with the syringe every afternoon softens the buds and assists them in breaking. Do not water abundantly until they are growing freely, and avoid, by all means, letting any cold draught pass into the early Vineries by having the door open for any length of time. During severe weather, access to such structures should be obtained through an inner door, or where such convenience exists, from a corridor behind them.

Pines.—See that the bottom-heat applied to the second plunged batch of these does not rise above 90° , any indication above which should be the signal to lightly raise the pots as recommended for the first lot. The roots of many early Queen Pines are often rendered useless through non-attendance to this, and consequently the plants refuse to start into fruit until new roots have been made. Valves for the regulation of the bottom-heat should be connected with every Pine bed, so that the heat could be conveniently raised or lowered at pleasure. The humidity kept up about early Queens should be increased in proportion to their growth. A little guano in the evaporating pans also helps to give the foliage a rich deep green tint, and keeps the atmosphere in a healthy condition. Pines are not generally dressed before they are sent to table; but they are much improved in appearance when the decayed blooms attached to the pips are neatly clipped off and the fruit brushed over afterwards, before it is set up for dessert.—J. MUIR.

Indoor Plant Department.

Conservatories.—Use just fire-heat enough to expel damp and frost, and no more; and, in the case of damp, ventilate the house at the same time. Maintain a temperature of 40° at night, with the usual daily rise. Water all evergreen plants moderately, and keep deciduous ones nearly dry. Plants in borders require watering very seldom at this season, there being but little demand upon the roots at this time of year; but pot plants, especially such as are near hot-water pipes, require unremitting attention as regards water, for, although apparently moist on the top, the soil at the bottom of the pots may be dry. Such a condition would be extremely detrimental, as the greatest amount of roots is amongst and over the drainage. Rather than keep the conservatory too warm, in order to forward the plants therein, supply any deficiency there may be in the way of flowers by means of Camellias, Azaleas, Jasminums, Weigelas, Kalmias, Prunuses, Acacias, Dielytras, Lily of the Valley, Dutch and Roman Hyacinths, Tulips, Narcissi, Crocuses, and other plants from the forcing pits. Decaying leaves must be regularly removed, and a rather dry and healthy atmosphere is a good remedy for such an evil, and to effect this, supply artificial heat and plenty of air. Keep Heaths, Epacrises, Chorozemas, Boronias, and Tremandras in the coolest and freest ventilated portion; and forced shrubs and other flowers in the warmest parts. Cut over Chrysanthemums that have done flowering, and keep a pot of each kind in a frame, if sufficient cuttings have not already been obtained. Plant the others in the open border, or, if not wanted out of doors, throw them away. Shift herbaceous Calceolarias and Cinerarias as they require it, and keep them cool and well watered; never permitting a damped or decayed portion of a leaf to remain. Fumigate to destroy aphis, and keep in mind the old maxim, "prevention is better than cure." Keep Mignonette near the glass, and stake and tie it as may be necessary. Have a good succession of it, as well as of Violets, and other plants, in pits. Regularly train Tropæolums, and give them a little manure-water when they have fairly started. Continue to pot off singly, good rooted, early autumn-struck cuttings of Azaleas, Camellias, &c., but if neither time nor space can be spared for shifting them at present, leave them for a time in their cutting pots set on a side-shelf of a close pit or intermediate house. Any Statice becoming too long-stalked should have an incision made on each branch just at the base of the foliated crowns, after which some Moss should be tied round it. The Moss should always be kept damp, and if a little silver sand is mixed with it so much the better, as it helps to encourage root-production. Keep old and young Statice moderately moist and in a minimum temperature of 45° . Pot off cuttings of Libonias and keep them for a short time in a warm pit, and when root action again begins, transfer them to an intermediate house. Divide the rhizomes of the variegated-leaved *Acorus javanicus*, and keep the divided portions for a time in gentle heat. From male *Aucubas* in flower gather the pollen and keep it dry between bits of glass for future use. Start into growth, in a warm pit, tropical *Crinums*. Re-pot and start some *Hæmanthus*es;

they may be placed upon the floor in a warm house or pit, or on a back shelf.

Bedding Plants.—Pelargoniums must still be kept rather dry, with the exception of a few plants of them, which should be placed in an intermediate house and moderately watered, in order to induce them to make young wood for propagating purposes. Keep all the finest-leaved kinds, such as tricolors and bicolors, near the glass, in light airy pits or greenhouses, and give them also sufficient water to prevent them from flagging. Verbenas, Ageratums, Salvias, Tropæolums, and similar plants, should be cleared of all decaying leaves, and dry wood-ashes or sand should be scattered over the surface of the soil in the pots or boxes that contain them. If the stock of them is short, introduce a few plants to a warm house, give them a fair quantity of water, and they will soon produce young wood, which may be made into cuttings. Indeed, from this time till the end of April, Verbenas, Ageratums, &c., may be forced and propagated in large quantities, for the cuttings root readily, and soon furnish tops and side-shoots, which may be used for a similar purpose. Sow some *Lobelia* seeds in heat, and prick off the young seedlings, as soon as they are fit to handle, into pots, pans, or boxes, containing light sandy earth well mixed with sifted leaf soil. By sowing *Lobelias*, pricking them out in time, and pinching them a little before the period for planting-out has arrived, they will bloom early and long. Cuttings of *Lobelias* may also be inserted as soon as convenient. Leave *Gazania*s undisturbed till March, it being then soon enough to propagate them; for early-struck plants become long and weakly before they are planted out, unless a good deal of room and pains can be devoted to them. *Calceolarias* in frames and boxes should be well ventilated in fine weather, and all decaying matter removed from amongst them. Remove the points of any shoots that are growing too rankly, and prepare cold frames for purposes of propagation next month. *Calceolarias* strike as well in cold frames if inserted in early February as they do if inserted in October; but, if the operation be delayed till March, they require a little heat to induce them to root readily. Any kinds of *Dahlias* that are scarce may be started in heat at once, and cuttings of them may be taken off and rooted as soon as they can be obtained; next month, however, or even the 1st of March, is soon enough for starting the general stock. If a good stock of *Caladium esculentum* be required, start some of the rested plants in a brisk bottom-heat, and, when they have begun to grow, remove the top and insert it as a cutting, still retaining the old root-stocks in the plunging material. Before long the latter will push forth a numerous progeny of young shoots, which may be separated individually after they form a leaf or two, and be used as separate plants. Rub over the incision with powdered charcoal, in order to counteract damp, and return the root to the position which it formerly occupied, keeping it there until it has exhausted every effort to produce another offset. Seeds of sub-tropical plants, such as *Solanums*, *Wigandias*, *Ferdinandias*, *Uhdeas*, &c., should be sown in heat as soon as possible, in order to have good strong plants before bedding-out time; and all old plants of these genera wintered in pots should be plunged in bottom-heat, in order to produce young shoots to be used as cuttings. Prune back *Hibiscuses*, *Cassias*, *Fuchsias*, *Abutilons*, and similar plants, so that they may begin to grow slowly and hardily. *Acacia lophantha*, raised from seeds sown now, makes good plants before May for mixing with other plants in small beds. Keep *Centaureas* rather dry than otherwise, in open airy houses or pits near the glass, and remove every particle of damped-off leaves that may be hanging about them, sprinkling powdered charcoal or dry wood ashes about their necks and over the soil. Treat *Echeverias* and other succulents like *Centaureas*.

Salt and Snow.—Mr. Church (see p. 17) and Mr. Mackie advocate the employment of salt whenever, through snow or frost, the roads become dangerous or difficult. The suggestion has evoked considerable opposition in many quarters, and especially from Dr. Alfred Carpenter, of Croydon, who points out that the application of salt to snow will have the effect of producing a very cold mixture, which is likely to penetrate the boots of pedestrians, and produce serious results. To this objection it may be answered that such would be the effect of the admixture of snow and salt were they enclosed in a close vessel, such as a refrigerator; but spread out on the road and pavements the conducting power of the earth will prevent the mixture from falling above one degree lower than that of the surrounding atmosphere. It is a certain fact that if the roads be kept moderately salted, which can be easily done by the admixture of rough salt with water in the ordinary watering carts, and its subsequent distribution over the roads, travelling through the slippery streets will be greatly facilitated, and much of the suffering and damage to horses, which has been observable during the last fortnight will be greatly lessened, if not entirely obviated.

THE BEST OF LAST YEAR'S NEW PLANTS.

THE following were awarded First-class Certificates by the Floral Committee at the Royal Horticultural Society's Meetings in 1874:

<i>Adiantum gracillimum</i>	Williams, May 13.
<i>Agave filifera superba</i>	Croucher, May 13.
<i>Agave micrantha picta</i>	Croucher, May 13.
<i>Alsophila elegantissima</i>	Bull, Feb. 18.
<i>Amaryllis (Hippeastrum) Oriflamme</i>	Williams, April 1.
<i>Amaryllis (Hippeastrum) vittata Harrisoniana</i> (as picturata)	Bull, Feb. 18.
<i>Angræcum citratum</i>	Veitch, Feb. 18.
<i>Anthericum Williamsii</i>	Williams, Nov. 11.
<i>Aquilegia leptoceras lutea</i> = <i>A. chrysantha</i>	Douglas, May 13.
<i>Azalea (mollis) Alphonse Lavalle</i>	Lane, May 13.
<i>Begonia Model</i>	Veitch, Sept. 2.
<i>Begonia Royalty</i>	Chambers, Oct. 7.
<i>Betula alba foliis purpureis</i>	William Paul, July 15.
<i>Boronia megastigma</i>	Veitch, April 1.
<i>Campanula Smithii</i>	W. Smith, July 15.
<i>Cattleya fausta</i>	Veitch, Oct. 7.
<i>Cattleya gigas</i>	Veitch, April 15.
<i>Cattleya Veitchiana</i>	Veitch, March 18.
<i>Cerasus Mahaleb pendula</i>	Paul & Son, Aug. 19.
<i>Ceterach aureum</i>	Williams, April 15.
<i>Cheilanthes Bergiana</i> (see <i>Hypolepis</i>)	
<i>Chrysanthemum (Japanese) Duchess of Edinburgh</i>	Veitch, Nov. 11.
<i>Chrysanthemum Gold Thread</i>	Veitch, Nov. 11.
<i>Chrysanthemum The Cossack</i>	Veitch, Nov. 11.
<i>Chysis Chelsoni</i>	Veitch, March 18.
<i>Cineraria, double-flowered</i>	Haage & Schmidt, May 27.
<i>Clematis Countess of Lovelace</i>	Jackman, April 15.
<i>Clematis Lord Gifford</i>	Noble, April 15.
<i>Clematis Lucie Lemoine</i>	Veitch, March 4.
<i>Clematis Marquis of Salisbury</i>	Jackman, April 15.
<i>Clematis purpurea elegans</i>	Cripps, June 4.
<i>Clematis Robert Hanbury</i>	Jackman, May 13.
<i>Coleus Duchess of Edinburgh</i>	Chitty, June 17.
<i>Cornus alba marginata</i>	Paul & Son, Aug. 19.
<i>Cyclamen Rose Queen</i>	Goddard, April 1.
<i>Cyclamen Royal Purple</i>	Goddard, April 1.
<i>Cypripedium Argus</i>	Veitch, March 18.
<i>Cypripedium Roezlii</i>	Veitch, Jan. 21.
<i>Dahlia Countess of Pembroke</i>	Keynes, Sept. 2.
<i>Dahlia John McPherson</i>	Keynes, Sept. 2.
<i>Dahlia Sarah McMillan</i>	Rawlings, Oct. 7.
<i>Dendrobium Ainsworthii</i>	Mitchell, Feb. 18.
<i>Dendrobium amœnum</i>	Bull, June 4.
<i>Dendrobium erythoxanthum</i>	Denning, Aug. 5.
<i>Echeveria Peacockii</i>	Croucher, July 1.
<i>Epidendrum catillus</i> = <i>E. Imperator</i>	Denning, March 4.
<i>Ficus Parcellii</i>	Veitch, April 15.
<i>Gladiolus Duchess of Edinburgh</i>	Kelway, Sept. 2.
<i>Gladiolus James Kelway</i>	Kelway, Sept. 2.
<i>Gloxinia Queen of England</i>	Gee, June 4.
<i>Gymnogramma triangularis</i>	Williams, May 13.
<i>Hæmanthus, Cooperii</i>	Henderson, May 13.
<i>Hippeastrum picturatum</i> (see <i>Amaryllis</i>)	
<i>Hollyhock Mulberry Gem</i>	Chater, Aug. 19.
<i>Hollyhock Rose Supreme</i>	Chater, Aug. 19.
<i>Hyacinth Anna</i>	Veitch, March 18.
<i>Hyacinth Cavaignac</i>	Veitch, March 18.
<i>Hyacinth Mr. Plimsoll</i>	Veitch, March 18.
<i>Hyacinth Quirine Christine</i>	Cutbush, March 18.
<i>Hyacinth Sir Garnet Wolseley</i>	Veitch, March 18.
<i>Hypolepis Bergiana</i>	Rollisson, May 13.
<i>Iris Kæmpferi Edward George Henderson</i>	Blackwood (as <i>Cheilanthes</i>), Aug. 19.
<i>Ixora Fraseri</i>	Henderson, July 1.
<i>Kniphofia McOwanii</i>	Fraser, July 15.
<i>Lilium speciosum atro-sanguineum rubrum</i>	Green, Oct. 7.
<i>Lilium Washingtonianum purpureum</i>	Wilson, Aug. 5.
<i>Lobelia (bedding) Duchess of Edinburgh</i>	Veitch, June 17.
<i>Lobelia (bedding) magnifica</i>	Lidgard, June 17.
<i>Macrozamia tenuifolia</i> ? (as <i>plumosa</i>)	Pine-apple Nursery Co., July 1.
<i>Mammillaria Roezliana longispina</i>	Bull, June 4.
<i>Metroxylon filare</i>	Croucher, May 13.
<i>Narcissus (Polyanthus) fl.-pl</i>	Bull, Aug. 5.
<i>Nerium Dr. Golfin</i>	Veitch, March 18.
<i>Odontoglossum Alexandræ Rothschildii</i>	Henderson, Sept. 2.
<i>Odontoglossum maxillare</i>	Richards, May 13.
<i>Oeceoclades guineensis</i>	Shields, Sept. 2.
<i>Oncidium fuscum</i>	Bull, Sept. 1.
<i>Pelargonium (double) Emily Laxton</i>	Veitch, April 1.
<i>Pelargonium (double) Jeanne Alegatière</i>	Laxton, June 4.
<i>Pelargonium (golden tricolor) Dr. Masters</i>	Wm. Paul, July 15.
<i>Pelargonium (show) Duchess of Edinburgh</i>	Henderson, July 1.
<i>Pelargonium (zonal) Sir Garnet Wolseley</i>	Braid, May 13.
<i>Pellæa decomposita</i> ?	George, July 15.
	Backhouse, June 4.

<i>Pellæa mucronata</i>	Backhouse, June 4.
<i>Pleocnemia Leuzeana</i>	Bull, Feb. 18.
<i>Polyanthus (bedding) The Bride</i>	Dean, March 18.
<i>Polyanthus (fancy) purpurea</i>	Dean, April 1.
<i>Primrose Splendour</i>	Dean, March 18.
<i>Primrose Violaacea</i>	Dean, Feb. 18.
<i>Primula (sinensis) Prince Arthur</i>	Perkins, Feb. 18.
<i>Puya chilensis</i>	Smith-Dorrien, May 27.
<i>Rapatea pandanoides</i>	Bull, Feb. 18.
<i>Rhododendron Duchess of Edinburgh</i>	Veitch, March 4.
<i>Rhododendron Early Gem</i>	Veitch, March 4.
<i>Rose (H.P.) Duchess of Edinburgh</i>	Bennett, April 1.
<i>Rose (H.P.) Madame Lacharme</i>	Bennett, March 18.
<i>Rose (H.P.) Royal Standard</i>	Turner, July 15.
<i>Rose (H.P.) Sir Garnet Wolseley</i>	Cranston, July 1.
<i>Rose (Tea) Duchess of Edinburgh</i>	Veitch, May 13.
<i>Rose (Tea) Madame François Janin</i>	Bennett, March 18.
<i>Sarracenia Stevensii</i>	Veitch, June 4.
<i>Saxo-Fridericia subcordata</i> (see <i>Rapatea</i>)	
<i>Selaginella lepidophylla</i>	Henderson, Sept. 2.
<i>Silene pendula flore-pleno</i>	Dean, July 1.
<i>Solanum quitense</i>	Veitch, Sept. 2.
<i>Sonerila Hendersoni</i>	Henderson, July 15.
<i>Sonerila Hendersoni argentea</i>	Henderson, July 15.
<i>Tacsonia insignis</i>	Backhouse, June 4.
<i>Toxicophlæa spectabilis</i>	Veitch, Feb. 18.
<i>Vanda limbata</i>	Williams, June 4.
<i>Viola (bedding) White Swan</i>	Dean, May 13.
<i>Vitis heterophylla humulifolia</i>	Woodbridge, Oct. 7.
<i>Zygopetalum Sedenii</i>	Veitch, Aug. 5.

Certificates Awarded at the Chiswick Trials.

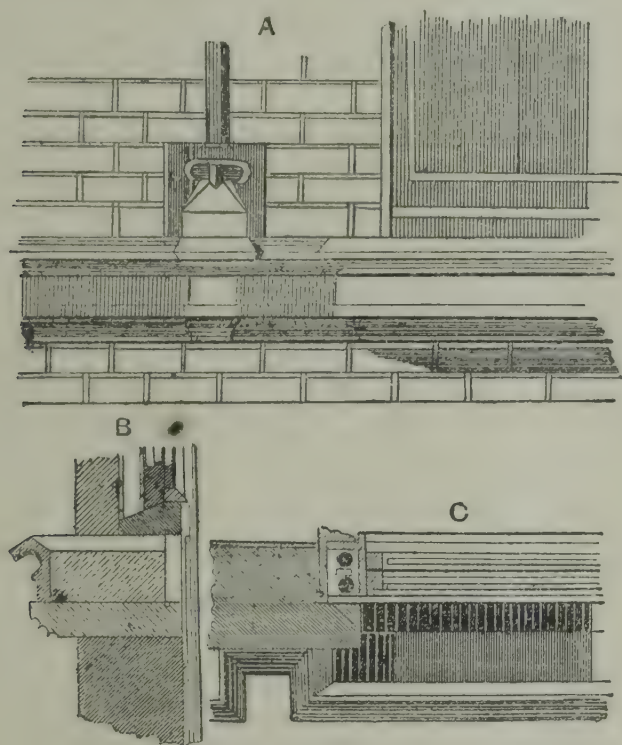
<i>Pelargonium Anna Pfitzer</i>	Henderson, Aug. 29.
<i>Pelargonium Bonfire</i>	Henderson, Aug. 29.
<i>Pelargonium Claude de la Meurthe</i>	Henderson, Aug. 29.
<i>Pelargonium Colonel Holden</i>	Pearson, Aug. 29.
<i>Pelargonium Ellie</i>	Miles, Aug. 29.
<i>Pelargonium Little Trot</i>	Davis, Aug. 29.
<i>Pelargonium Master Christine</i>	Veitch, Aug. 29.
<i>Pelargonium Mrs. Halliburton</i>	Kinghorn, Aug. 29.
<i>Pelargonium Mrs. Tate</i>	Pearson, Aug. 29.
<i>Pelargonium Mrs. Turner</i>	Pearson, Aug. 29.
<i>Pelargonium Prince Arthur</i>	Fraser, Aug. 29.
<i>Pelargonium Queen of Beauties</i>	Hodgson, Aug. 29.
<i>Pelargonium Rev. T. F. Fenn</i>	Pearson, Aug. 29.
<i>Pelargonium Richard Dean</i>	Henderson, Aug. 29.
<i>Pelargonium Sparkler</i>	Henderson, Aug. 29.
<i>Tropæolum compactum yellow</i>	Dean, Aug. 29.
<i>Viola Blue Bell</i>	Dean, July 15.
<i>Viola Dicksons' Golden Gem</i>	Dicksons & Co., July 15.
<i>Viola Dicksons' King</i>	Dicksons & Co., July 15.
<i>Viola Dicksons' Queen</i>	Dicksons & Co., July 15.
<i>Viola Imperial Blue Perfection</i>	Dean, July 15.
<i>Viola Lily White Tom Thumb</i>	Dean, July 15.
<i>Viola Miss Maitland</i>	Milligan & Kerr, July 15.
<i>Viola Mulberry</i>	Dean, July 15.
<i>Viola The Tory</i>	Dicksons & Co., July 15.
<i>Viola Tyrian Prince</i>	Dean, July 15.

Rats and Cantharikopho.—I beg to inform Mr. Balderstone that, my cottage having been infested with rats for some time, I was induced to try a box of Cantharikopho, procured direct from Messrs. Rollisson, and, to my satisfaction, I have not seen a rat or any indication of the presence of one since. With regard to mice, I used it in my potting-shed, which was over-run with them, and also on cockroaches and crickets, and I have found it in all cases efficacious, except in that of woodlice, which I find will not touch it until it has been exposed to the atmosphere for some ten days, when they will eat it, but of course with impunity, as its destructive properties are then gone.—A. H. MAY, *Wimbledon Park*.—Captain Crawley, writing to Messrs. Rollisson from the Temple Club, Arundel Street, Strand, says that he has tried the Cantharikopho, and has found it to answer admirably. Kitchens, stables, and cellars have all been cleared of mice, cockroaches, &c., by it, and he asserts that it is a most effectual and fatal, though, apparently, an enticing meal.

Tan for Mulching.—There is much difference of opinion as to the value of tan as a mulching material. A recent writer in the *Revue Horticole* cites several instances in which its effects were disastrous upon fruits and vegetables. Several market gardeners near Paris lost all their winter Lettuce by covering the beds with tan. Any ill results must be due to the fact that the bark was not thoroughly exhausted. When the soluble matter is all extracted from it, the effect of the tan can only be a mechanical one. Where there are such different experiences, it will be safe to expose the tan to the action of rains for some months before using it.

WINDOW GARDENS.

MANY and varied have been the contrivances invented to afford facilities to those dwellers in town who indulge outside of a window in the pursuit of horticulture "under difficulties." As a rule, all those inventions, while they may answer the purpose in a horticultural point of view, are anything but ornamental in an artistic sense. A correspondent of our excellent contemporary, the *Building News*, appears to have fallen on a plan to unite use and ornament. The very ingenious mode in which he does so will be best seen and understood by giving his letter and reproducing the illustration, for which we are indebted to the same source:—"External window gardens are now so common in England that it is time architects incorporated them in their designs for villas and cottages. At present they disfigure rather than improve the appearance of houses. If we wander through Belgravia or any modern locality, we shall find at least half the dwellings with windows blocked up by rude unsightly temporary boxes, each vying with the other for unsightliness and for shutting out the daylight. We find that the builder has gone to the expense of glazing the windows with plate glass, about a fourth of which is rendered useless by the tenant's questionable adornments to them. Provision for window gardens is, therefore, a want that should be provided by the builder. The want has been partially met by the balcony or projecting shelf-like sill, but the same rude box is placed upon them to hide the lower part of the glass and obstruct the light.



An improved Window-box.

There are various ways in which the window garden may be architecturally treated, but a hint may be gleaned from the accompanying sketch, of which fig. A shows elevation of part of the front wall and window; fig. B a section of the window and box for earth; and fig. C a plan of same. It will be seen that the ordinary window sill is entirely abandoned, and a box substituted in its place, running under the woodwork of the window till it meets the internal plastering, or what joiners call the window back. Thereby some of the heat of the room is imparted to the flowers, and when the fire-place is situated near the window the heat would assist to make a miniature conservatory."

HAWTHORNS.

WITH one or two exceptions, these are deciduous, ranging in height from about 10 to 30 feet. They have a wide geographical distribution over Europe, Asia, and both Continents of America, and are nearly all hardy enough for open-air cultivation in Britain. A large proportion of the species and varieties are valuable for the ornamentation of parks, margins of woods, and shrubberies, where, from their picturesque outlines, elegant foliage, and the profusion of their showy blossoms, followed, in most cases, by brilliant and conspicuous fruit, they have a peculiarly striking effect, and are justly regarded as worthy of a prominent place in the choicest collections of ornamental trees and shrubs. Many of the sorts, and notably the common Hawthorn with its varieties, are admirably adapted for planting in town gardens and squares, where they grow vigorously, and seldom fail to flower, notwithstanding the dust and smoke, so injurious to most forms of tree life. All the species are found to succeed best in rich, but light, soil, with the ground either

naturally dry or sufficiently drained to prevent any accumulation of water at the roots. They flower and fruit most freely when planted in open sunny situations. In planting, enough of space should always be allowed for the free spread of their branches without coming in contact with neighbouring trees. In making a small selection from a genus containing some fifty or sixty species and varieties, many that are really desirable must necessarily be omitted; the following, however, are among the most popular, and well worth the attention of intending planters, being quite hardy, very distinct, and at the same time highly ornamental.

C. Oxyacantha (the common Hawthorn).—This, the type of the genus, is indigenous to most countries in Europe, including our own, where it has been grown as a decorative tree "time out of mind"—the pride of the humble cottage-garden and the village-green,

With seats beneath its shade
For talking age, and whispering lovers made;

and not less so in the noble parks and well-kept pleasure-grounds of the rich, rivalling all the other trees in beauty when in blossom, while its ample spreading head and gracefully bending branches render it at all times a pleasing and interesting feature in the landscape. Its importance as a hedge-plant, either by itself, or mixed with Beech or Privet, is well known; and it need scarcely be said that, if kept properly trimmed, no plant makes such a close, strong, and durable fence. The snow-white sweetly-fragrant flowers are produced in great abundance in May or June, according to the season, followed generally by a crop of red fruit, usually ripe in September. The leaves are obovate, wedge-shaped, sometimes nearly entire, but more frequently deeply cut into lobes; in spring they are of a light green, changing in summer to a darker tint. There are a great number of fine varieties of this species, more or less distinct and handsome. The following are among the most useful for decorative planting:—*Variegata aurea* and *v. argentea*, with gold and silver variegations, are interesting as varieties, though by no means to be classed among the showiest of variegated trees; *fructo-lutea* differs from the parent in having yellow fruit, and is very ornamental in autumn and early winter; *Reginæ pendula* is a fine weeping form, quite distinct from the species—the original tree, known as Queen Mary's Thorn, stood in a garden of the Canongate of Edinburgh which belonged to the Regent Murray, but was cut down some years ago; *spinosissima* is remarkable for the great number of stiff sharp spines with which the branches are thickly studded, and which have a curious effect when the leaves are off; *coccinea* is the well-known scarlet Thorn, a universal favourite, which cannot be too extensively planted; *laciniata* differs from the parent in its leaves being deeply cut into numerous segments; *præcox*, the Glastonbury Thorn, is interesting from producing its leaves and flowers much earlier in the season than either the species or any of the other varieties. There are also the following double-flowered sorts, which are truly beautiful when in bloom, and cannot be too highly recommended for planting in shrubberies among the larger-growing evergreens, or for single specimens either in parks or lawns:—*Albo pleno*, double white; *rosea plena*, double pink; and *coccinea plena nova*, the last known as Paul's Double Scarlet Thorn, a variety of recent introduction to our gardens, but already widely distributed, and undoubtedly one of the most valuable acquisitions to the list of hardy flowering trees, flowering, like the other double sorts, when only a few feet high, and quite showy enough for the finest flower garden. Forced in a gentle heat, it is a grand plant for the conservatory in early spring.

C. Aronia (the Aronian Thorn).—This species, indigenous to Greece, as well as several other countries in the south-east of Europe, and introduced in 1810, is a distinct-looking handsome tree of about 25 feet in height. It has a very densely branched, rather erect habit of growth; the leaves are wedge-shaped at the base, deeply lobed, and toothed at the edges; the young shoots and under surface of the leaves are slightly pubescent. The flowers, which generally expand in June, are white, followed by large yellow fruit ripe in September, and not only very ornamental, but eatable—making excellent tarts either alone or along with Apples. It is an interesting park or avenue tree.

C. coccinea (the Scarlet-fruited Thorn), indigenous to North America, from Canada to Carolina, and introduced into Britain in 1683, is a bushy spreading tree of from 25 to 30 feet in height. The leaves are of an ovate-cordate form, serrated, much larger than those of the common Hawthorn, and of a warm green colour, changing at the fall to a bright yellowish-red. The flowers are large and showy, pure white, and expand in the beginning of June. The fruit is of a brilliant scarlet colour, very palatable, and ripe about the end of September. It is a distinct and very ornamental park specimen-tree.

C. Crus-galli (the Cockspur Thorn).—Another North American species, with a similar distribution to the preceding. It was first

introduced about 1791, and in this country grows to heights of from 15 to 20 feet. The specific name was given in allusion to the long bent spines with which the branches are armed, giving the tree a singular appearance in winter. The leaves are of an obovate form, slightly serrated at the edges, of a smooth shiny green colour, and are remarkable for remaining on the tree longer than those of the other deciduous species. The flowers are white, and usually in perfection in June. The fruit is bright scarlet, and ripe about October. As a park specimen-tree it is very ornamental, and, though quite hardy, succeeds best in a sheltered situation. Of several interesting varieties in cultivation the most distinct is *salicifolia*—a curious, broad, horizontal branched tree, with oblong nearly lanceolate leaves, suggestive of those of some of the Willows: it forms a most effective contrast in mixed collections of decorative trees.

C. cordata (the Heart-shaped-leaved Thorn), a native of North America, found over a vast tract of country in Canada and the United States, and growing to heights of from 20 to 30 feet. The leaves are large, cordate-ovate, very abundant, and of a shiny deep-green colour. The flowers are white, and though individually small, are produced in large terminal corymbs, and have a pretty effect in May or June, when in perfection. The fruit is scarlet, but small and inconspicuous, and ripe about October. When planted in a dry sheltered situation, this forms a neat specimen-tree, with a close bushy habit of growth, well suited for planting in a choice collection.

C. macrantha (the Long-spined Thorn), found wild in great abundance in the Northern States of North America, from whence it was first introduced in 1819. It is a broad-spreading tree of about 25 feet in height, and remarkable for its numerous long sharp spines. The leaves are large, ovate-oblong, serrated, and of a bright green colour. The flowers are white, and usually in perfection in June. The fruit is scarlet, very small, but generally produced abundantly; ripe about September. As a park tree, it is conspicuous and pleasing, and ought to be more frequently planted. It thrives best in a moderately sheltered situation, and in dry porous soil.

C. tanacetifolia (the Tansy-leaved Thorn), indigenous to Greece and adjoining countries, and introduced in 1789, is an upright-growing tree of about 30 feet in height. The leaves are somewhat larger than those of the common Hawthorn; deeply divided into irregular segments, and covered with a minute down. The flowers are white, and expanded in May or June. The fruit is round, large, eatable, and of a golden-yellow colour. This species is an old favourite in our parks and pleasure grounds, growing, as it does, almost everywhere, with great vigour, and forming a remarkably attractive specimen, its peculiar grey-coloured foliage contrasting well with the darker shades of most other trees. Of several distinct varieties the most interesting is *Leeana*, which differs from the parent chiefly in its more robust, closer, more fastigate habit of growth, and in its larger, less divided leaves; it is a handsome and most desirable ornamental tree.

C. punctata (the Dotted-fruited Thorn), a North American species, found over a large tract of country, particularly in Virginia and Carolina, is a small bushy spreading tree of about 25 feet in height, introduced in 1746. The leaves are obovate, wedge-shaped, acutely serrated, and of a bright shining green colour. The flowers are white, expanding in June; the fruit is bright scarlet, dotted or speckled. The following varieties are distinct, and worthy of special notice:—*rubra*, with fruit of a darker red, and a habit of growth more robust than the parent; *stricta*, differing only in its fastigate habit; *fructo-aurea*, with the upright habit of the preceding, but with golden-yellow fruit. All the sorts are beautiful trees, and well deserving of a place in the park or ornamental plantation.

C. orientalis (the Eastern Thorn), found wild in the Crimea and northern borders of the Black Sea, is a small bushy tree of about 20 feet in height, introduced in 1810. The leaves are deeply lobed, downy on the under side. The flowers are white, expanding in June. The fruit is very large, eatable, of a deep purplish-red colour, and ripe about September. It is a distinct and neat-growing lawn or shrubby tree, and ought to be better known.

C. Douglasii (Douglas's Thorn), indigenous to North-west America, from whence it was first sent home in 1827, is a strong-growing shrub or small tree of from 10 to 15 feet in height. The leaves are obovate, sometimes ovate-serrated, dark shining green, changing, as they decay, to a dark red. The flowers are white, and generally expand in June. The fruit is small, but produced in great abundance, of a deep red, almost purple colour, and ripe about September. It is a very distinct and interesting plant for a mixed shrubbery, most effective either when in bloom or when laden with its rich-coloured fruit, which it retains till late in the season.

C. Pyracantha (the Pyracantha).—This is an evergreen species indigenous to the south of Europe, where it is found as a spreading bush, with long slender branches, rarely rising higher than about

10 feet; it has been in cultivation here since 1629. The leaves are entire, crennated, and of an ovate-lanceolate form. The flowers are white, produced in large corymbs, and usually in perfection in May. The fruit, which it rarely fails to produce in great abundance, is brilliant scarlet, ripe about September, and remaining on the plant during the greater part of the winter, and even sometimes till the spring. The yellow-fruited variety, *fructo-lutea*, though not so striking, is, nevertheless, a fine companion plant to the species. Though sometimes grown as a shrub in the open border, or grafted as a standard on the common Hawthorn, and as such very ornamental, this species is at once best known and most useful as a wall or trellis plant, for either of which purposes, particularly the former, it has few rivals. Whether we take into account freeness of growth, elegance of foliage, or the striking beauty of either flowers or fruit, it can scarcely be too strongly recommended where a thoroughly hardy plant is wanted for the decoration of a villa dwelling, or a flower-garden wall. It delights in a dry but rich soil, and thrives all the better for an occasional supply of well-rotted manure.—*The Gardener*.

PERSONAL.

MESSRS. CARTER'S challenge cup will again be offered for competition at the provincial exhibition of the Royal Horticultural Society, should one be held this year, and along with it £10 10s. as first prize; the second, third, and fourth prizes being of the value of £7 7s., £5 5s., and £3 3s. respectively. Other prizes for vegetables, of considerable value, are also offered by this firm.—MM. Nardy & Co. have established at Salvadour, near Hyères, a nursery which, from the reputation of its founder and its climatic advantages, will probably prove of importance in the introduction of new plants. MM. Nardy liberally offer to botanists, directors of botanic gardens, horticultural societies, and the like, the opportunity of using their grounds as trial grounds for testing the hardiness and applicability of new plants, and promise to report progress regularly to those interested.—The King of Italy has conferred the honour of Commander of the Order of the Crown of Italy on MM. Linden and Ronnberg, and that of Chevalier on MM. Bernard, Dallière, Kegeljan, and Morren. The immediate occasion of these honours was the International Horticultural Exhibition at Florence.—Mr. J. C. Marsh, for some years gardener to J. O. Bacchus, Esq., of Leamington, and well known as a successful exhibitor, is said to have perished in the ill-fated ship, *Cospatrick*.—On New Year's Eve Messrs. Cranston and Mayo treated the workpeople employed in their nursery at King's Acre, Hereford, to a supper, concert and ball.

NOTES AND QUESTIONS.

[THE following notes and questions came to hand, or were answered too late for insertion in their several departments.]

Draining Lawns or Cricket Grounds.—Would any of the readers of THE GARDEN favour us with their experience as to the proper depth of drains for lawns or cricket grounds? The sub-soil in our case is peat.—W. J., *Lancashire*.

The Belgian Mole Trap.—Have any of your readers used this trap, or can they inform me if it is in any way superior to any of the mole traps generally in use in this country.—ENQUIRER.

Some Good Wall Roses: L. H. Jules Margottin, Céline Forestier, Fellerberg, Lamarque, Ophir, Gloire de Dijon, Climbing Devoniensis, Red Rover and Climbing Victor Verdier.

Hardy Amaryllids: W. T. S. Amaryllis Belladonna is a hardy bulb, which does admirably when planted rather deeply in good soil at the foot of a south wall. Mr. Barr informs us that it flowers perfectly with him in the open field. The Crinum capense is also perfectly hardy.

The Olive.—Can any reader of THE GARDEN supplement the information given at p. 13, with further facts relative to the soil best adapted to the cultivation of the Olive, whether the climate is damp or dry, the locality hilly or sheltered, what kind of manure (if any) is required for a successful crop of fruit? how propagated, and at what age the tree begins to bear?—G. A. H.

Conifers for a Damp Situation.—I should be much obliged for information about the kinds of Conifers best suited for a swamp near the waterside. Am I right in supposing that *Juniperus Virginiana*, *Taxodium distichum*, and *Thuja occidentalis* would find themselves at home in such a situation? Information from anyone who has observed these or other Conifers in their native swamps would much oblige.—SALMONICRIPS.

Furnishing a South-west Wall with Fruit Trees.—I am much interested just now in endeavouring to ascertain the best way of furnishing a south-west wall with Pear trees. My idea was to have fan-trained trees, at about 12 feet apart, as permanent trees, putting some five-tined between, to bear for a few years, and then be removed. I went expressly to Sawbridgeworth to purchase these trees, but Mr. Rivers persuaded me to have horizontal train instead of fan-shaped. In planting these latter I could not bring the side shoots opposite the wires, and, altogether, the arrangement was most unsightly. I, therefore, determined to put in only the five-tined trees, 5 feet 8 inches apart. With this, however, I am not quite satisfied, as the space nearly 4 feet between the trees is entirely wasted. I am aware that they may be planted a little closer, but they would, to my mind, never look well. W. B. S., therefore, who wrote last week in THE GARDEN on this subject, states where Verrier Palmette trees can be obtained; also, if five-tined trees would do to put between instead of flat standards? The wall is nearly 100 feet length, 9 feet high and wired.—B. Hook, *the Cottage, Bradfield, Berks*.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

SEEDS AND SEED CROPS.

Most gardeners select their own seeds, stating both variety and quantity required, and, whether the order be large or small, this is the best course to follow. Of late years it has become the practice with some seedsmen to offer certain quantities of seeds—to crop gardens of given extent—at what may happen to be tempting prices, but only the inexperienced will be led away by such offers. Hardly two kitchen gardens are cropped alike, as regards quantities and varieties. Here a certain vegetable is in constant demand; there it is, perhaps, not wanted at all. In one place certain varieties are found to succeed, and in another they are a comparative failure; and this applies to the villa garden just as much as to the nobleman's 6-acre enclosure. How then can the seedsman anticipate your wants? He will be able, no doubt, to dispose of his stock in a satisfactory manner to himself, but the customer will have to pay for many things he does not want. Let everyone therefore order what he requires, and he ought to get his own selection as cheap, proportionately, as the seedsmen do. I may state here that some if not all the so-called "collections" of seeds advertised to crop kitchen gardens of different dimensions, are neither suitable in kind, nor sufficient in quantity, for the purpose. Economical as we can be, to the extent of saving all old seeds to mix with the new, I find a kitchen garden of 4 acres cannot be furnished at anything like the price of the seedman's "collection," after making a slight allowance for bad seeds, birds, and vermin. I see some respectable firms repudiate the practice of selecting for their customers, realising fully that they cannot do so with satisfaction to either party, and it would be well if others were to follow their example. Possibly some economy might be effected if every seed was sure to vegetate; but, as such a thing cannot be guaranteed, the gardener has to sow much more thickly than is absolutely necessary to ensure a crop; and, in estimating how much seed is required for an acre, such contingencies must be taken into account. Of course the seedsman is not always to blame for failure; sometimes the customer's want of care in storing is the cause. Still, we have often seen signal failures with such things as Peas, Carrots, Onions, &c., from seed sown when it arrived from the shop, and said to have been proved before sending out. To prevent disappointment from any cause as much as possible, the best plan is to deal only with respectable firms, who are careful to meet their customers' wants. To retain the latent vitality of seeds as long as possible, they must be preserved from the exciting influences of heat and moisture. It is desirable that they should never be subjected to a higher or lower temperature than 40°, but it is absolutely essential that they should be kept dry. The moment a seed comes in contact with moisture it begins to grow if the temperature is high enough, and if not then placed in circumstances congenial to its development, as in the soil, it will of course perish. Without moisture in sufficient quantity to excite growth, however, seeds may be subjected to a much higher temperature than 40° without any immediate bad effects, though a high and dry temperature impairs their vitality; hence it is that seeds that have been kept for several years do not germinate so vigorously, though they are generally more fruitful. For this reason, old Melon seeds are preferred to new, as they do not run so much to vine; and when new seeds only of a variety are to be had, some gardeners carry them in their pocket, or keep them in a warm room for a while to effect the same end. On the other hand, it is equally necessary to keep seeds dry under a low temperature—42° being the growing point, or lowest temperature at which seeds will germinate as a rule; exposure to damp below this figure promotes decay, especially in the more tender seeds. Thus, Kidney Beans, for instance, may be subjected for a time to a temperature of 35° without much injury if they are kept

dry, but it is a well-known fact that they will perish almost rather than germinate in soil below a temperature of 45°; hence early crops are generally uncertain. Under these circumstances, and seeing that collections of seeds, even for a large garden, are not very bulky, the best plan is to keep them in a portable cupboard, which can be moved when required and may be found needful in very warm or very cold weather. Where seed saving in quantity is an object other arrangements must, of course, be made, but having pointed out the essentials it is only needful in such cases to adapt them to circumstances. The seed press should be methodically pigeon-holed, according to the quantities each space has to hold, and these should be labelled to prevent confusion. These remarks being intended for seed sowers rather than seed growers, I need say nothing about seeds-bags or packets, further than that the seeds should be stored in the brown paper parcels in which they arrive, and be taken out when wanted. Many failures date from the period of sowing, for which, not unfrequently, the seedsman is unjustly blamed. To prevent disappointment it is a wise plan to prove seeds before sowing, especially vegetable or flower seeds, of which large breadths have to be sown. To do this it is only necessary to sow a few seeds of each variety in a small pot, in light soil, and introduce them to a moist temperature of 90° or a 100°, taking care to water them about a day after sowing. If they possess any vitality they will soon show it under such a stimulus, and the number of seeds of each kind that germinate will be a guide for future operations. In sowing small seeds everything depends upon the care and intelligence of the operator, and in outdoor crops, such as are committed to the ground at once, much importance attaches to the condition of the soil, and the time of sowing different crops. With small seeds, such as the *Calceolaria*, *Primula*, *Lobelia*, *Celery*, herbs, &c., failure often results from using an unsuitable soil, deep or thick sowing, and careless watering. With regard to soil, though many plants will thrive well in a strong loam after they are established, no seeds of any kind will germinate readily in such a medium. For all small seeds the soil should be light, fine, and rich—light and open so as not to exclude the air, so finely divided and loose as not to obstruct the young stem in its ascent to the surface of the soil, and rich in order to promote a quick and vigorous germination, that the seedlings may escape the many destructive insects and grubs which are continually on the alert to prey upon them at this stage, and also to enable them to resist any external influences that have a tendency to lower their vitality. A poor soil is the worst of all for a seedbed, and farmers and gardeners know from experience that a vigorous start is the surest guarantee of a crop with many things, such as Turnips and Carrots, that so often fall a prey to vermin, if from any cause germination is slow or retarded. Deep sowing is a frequent source of failure. It is a pretty well known fact, that seeds buried beyond a certain depth will not germinate at all, though they do not lose their vitality; but many persons, whose duty it is to sow seeds frequently, are hardly aware how thin a layer of soil is sufficient to prevent germination altogether, or at least to impair the vigour of the plants so much that when they do come up they will hardly recover. Thus small seeds like the *Calceolaria* will barely vegetate under half an inch of soil, as we have proved; that depth is more than sufficient for such hardy plants as Cabbage and Turnips, especially if the soil be heavy and apt to cake. Peas and Seakale are in no way benefited by being covered deeper than an inch or an inch and a half. Deep sowing gives a plant no better hold of the ground than if it was left to vegetate on the surface; it is thin sowing, or room, that makes a stable plant. In soils for all small seeds, sand is a highly useful ingredient as a disintegrating agent; while decayed leaf soil, or humus, finely sifted, will give lightness, and, in general, sufficient richness for a seed bed. The surface of the soil in seed pans or boxes should be made quite even with a piece of wood or slate, and small seeds should be barely covered. It should always be borne in mind that sufficient soil to ensure a moderate and uniform degree of moisture about the seed, and a ready access to food for the young roots, is all that is required; these secured, seeds do not appear to be much affected by the

presence of light or by its absence. Thick sowing is a mistake no good gardener will commit. When it is necessary to sow plentifully to ensure a crop, the seeds should by no means touch each other, as, under such circumstances, decay and rottenness are apt to be produced, particularly if the seed be old. Outdoor crops are not likely to be injured by artificial watering, but a careless man will often ruin a seed pan with the watering pot, notwithstanding all previous care in sowing. The finest rose should be used for watering purposes, and the soil should only be damped, repeating the operation again and again till the watering is effected; never float the surface, and never direct the full force of the water upon it, or the seed will be washed on one side, or out of the pan altogether. As regards outdoor crops, much depends upon the weather in the effect it has upon the soil. Seeds sown in a wet soil never come away freely; it is better to wait till the latest moment than sow under such conditions. Those crops do best, without doubt, which, favoured by suitable weather, come away and grow uninterruptedly from the seedling state. Still, though I am not tied to dates in sowing crops, as old gardeners used to be, there is a period in spring beyond which sowing cannot be delayed without risk. For instance, Onions should be sown some time in March; if delayed much past the beginning of April, the crop will not be a good one. Late Wrinkled Marrow Peas do little good, in late localities, at least, if sown before the first of April. Neither is time gained by sowing Seakale before this date. Nearly ninety per cent. of Turnips sown in January go to seed—often the entire crop—and they are not earlier than those sown in March. The same may be said of Peas, unless in exceptional seasons. Cauli-flowers sown in heat in January, and pushed on as early autumn-sown plants generally are, come into use just as soon. Beet sown in March, or earlier than the middle of April or beginning of May, will nearly all go to seed. Carrots are much better out of the ground till the soil is warm enough to start them into vitality about April. For Parsley the ground should be rich and deep. It should be sown as the ground is dug and covered with light and very rich soil, in order to coax it into early leaf, and it should be early thinned out if it has to afford a winter supply. Broccoli, sown in February, and another lot in March, will generally all come in at the same time, but there is a much better chance of a succession if the last sowing be delayed till the middle of April or till May. French Beans, sown before the temperature of the ground reaches 45°, will hardly move perceptibly, and will rot in the ground. Celery sown in March or April, and planted about the middle of June, is early enough to ensure good useful heads in August and September, and planting may be continued till August. It is an excellent plan to steep all hard-cased seeds, such as Peas, Seakale, Beetroot, &c., in tepid water for twenty-four hours before sowing, especially if this has been delayed, in order to promote germination, but seeds sown in good time do not need steeping, for, though they may be got through the ground sooner, their after progress being dependent upon the weather, they gain nothing in time in the end.

J. S. W.

The Best Twenty-four Hollyhocks.—The following, says Mr. Dean, is a list of the finest flowers in cultivation:—Alba superba, pure white; Black Gem, glossy blackish-maroon; Competitor, deep rich purple; Eclipse, bright rosy-red; Edward Speed, French white, suffused with deep purple; Eleanor, soft pale rose, a greatly improved Willingham Defiance; Emperor, crimson-maroon; Exultium, rich shining maroon; Fire King, bright glowing reddish-crimson; Golden Drop, perhaps the deepest and brightest yellow in cultivation; Jessie Dean, clear apricot sometimes tinted with salmon; Joshua Clarke, brilliant cherry; Junia, pale primrose, suffused and stained with purple; Leviathan, bright reddish-rose, very fine; Lord Napier, deep glowing scarlet-crimson; Midnight, deep glossy maroon; Mrs. W. Chater, pale flesh, the colour deeper at the base; Nonpareil, rich dark purplish-maroon; President, yellowish-buff, heavily suffused and tinted with rose; Rose d'Amour, beautiful rosy-peach; Ruby Queen, deep shining ruby; Walden King, bright scarlet; Walden Queen, beautiful soft delicate flesh; and Walden Primrose, clear pale primrose. It may be added that of this list all are seedlings raised by Mr. Chater, with the exception of two raised by Lord Hawke.—“Florist.”

NOTES OF THE WEEK.

— THE engraving of *Lapageria rosea*, growing in the open air in the Lucombe Nurseries, Exeter, is an exact reproduction from a photograph, and well shows what may be done with this noble climbing plant in the south of England.

— A NEW hybrid Pitcher plant was exhibited by Messrs. Veitch at the last meeting of the Royal Horticultural Society, and received a first-class certificate. It is a seedling, raised between the well-known *N. Rafflesiana*, and an unnamed species with small spotted pitchers. In shape and colour the Pitchers resemble those of the first-named parent, and in size are equal to those of *N. hybrida maculata*.

— MR. COX exhibited at South Kensington on Wednesday last a new Apple, a seedling from the well-known Golden Knob, and one which is likely to prove a valuable addition to late-keeping dessert sorts. It is named Redleaf Russet, and possesses a very agreeable flavour, being both brisk and juicy.

— MESSRS. SUTTON, of Reading, have published a “Miniature Spring Catalogue,” pocket size and weighing only 2 ounces. It is a reproduction of their large “Spring Catalogue and Amateur’s Guide,” including the cuts and ornamental borders, the type used being very small but clear. It is a curiosity in its way.

— THE assistant-secretary of the Meteorological Society, Mr. William Marriott, has published a very useful table to facilitate the determination of the dew-point from indications of the wet and dry thermometers, which allows anyone to obtain the dew-point at inspection without going through several calculations.

— RHODODENDRON ARGENTEUM, one of the very best of all the white-flowered kinds, is now in flower. A fine truss of it, fully 6 inches across, was exhibited at the Royal Horticultural Society’s meeting, on Wednesday last, under the name of *R. niveum*. It appears to be a variable plant.

— WE have received specimens of Mr. Ware’s bedding Pansy called Modesty, a variety distinguished from all others of its kind by the abundant way in which it blooms in winter, there being at present thousands of flowers on a bed of it in his nursery, at Tottenham. In colour it is purplish-lilac, with a dark eye set in white.

— MR. CHARLES DARWIN’S new work on “Insectivorous and Climbing Plants” is in the press and will be shortly published. The following are the contents:—Part 1, On the sensitiveness of the leaves of *Drosera*, *Dionaea*, *Pinguicula*, &c., to certain stimulants; and on their power of digesting and absorbing certain animal matter. Part 2, On the habits and movements of climbing plants. The book will be issued by Mr. John Murray.

— MR. PARKER and Mr. Barr have both sent us flowers of *Crocus Imperati*, one of the most beautiful of all Crocuses, and one doubly valuable inasmuch as it is a winter-blooming species. Its sepals are yellow on the outside, streaked with very dark purple, while the insides of the sepals and the whole of the petals are of a soft lilac-purple, faintly streaked with deeper-tinted veins. It is a plant which deserves a foremost position in the collection of all who appreciate hardy early-flowering bulbs.

— A VIGOROUS plant of *Eulophia guineensis* is now bearing two fine spikes upwards of 2 feet in length in the Orchid-house at Kew. In form the individual flowers remind one of those of *Galeandra Devoniana*, except that they are a little smaller in size. The segments of the perianth are greenish, shaded with brown, the conspicuous part of the flower being the rich rosy-lilac long-spurred lips. If we except the brilliantly-coloured large-flowered *Disa*, this is one of the most effective of all terrestrial Orchids, and a worthy companion to the rich golden-flowered *Cyrtopogon flava*.

— NEOTTIA MACULATA is now flowering in the cool Orchid-house at Kew, and, although like its congener, *N. speciosa*, an old inmate of our gardens, it nevertheless deserves mention as a very distinct and beautiful plant. The rich velvety deep green leaves are blotched with lighter green, and the reddish-crimson flower-buds and bracts form a brilliant contrast, and prove attractive for several weeks. A large pan of this plant, if well grown, would form a very distinct and beautiful addition to the few crimson-flowered Orchids which flower at this season.

— THE annual meeting of the Gardeners’ Royal Benevolent Institution took place on the 14th inst. The report, which was read, showed that there are seventy-two pensioners on the charity, receiving £930 annually; that the income amounts to £1,747, and that there is now an invested capital of £10,400 in Consols. After the close of the meeting a testimonial was presented to Mr. Cutler, after thirty-two years’ service as secretary to the institution. It consisted of a very handsome one, the sum realised being £250. It was a silver tea and coffee service with salver, table forks and spoons, and a massive gold watch-chain; a valuable diamond half-hoop ring and a gold watch-chain were also presented to Mrs. Cutler.

THE LUCOMBE NURSERIES, EXETER.

In a nursery that has been in existence over a century-and-a-half, we naturally expect to find many things rarely found in establishments of more recent origin, and in this instance we were not disappointed. Apart from the fine climatic position occupied by this well-known Devonshire nursery, it has been managed, from its first commencement until the present time, by proprietors who have taken a more than ordinary interest in all that concerns horticulture, apart from its pursuit as a commercial undertaking. With the taste and skill displayed by the late Mr. Pince in ornamental ground-work and planting most of us are familiar, and the present proprietor, Dr. Woodman, an enthusiastic horticulturist like his late relative Mr. Pince, has already attained considerable reputation as a landscape gardener. The outdoor department consists of nearly a hundred acres, covered with ornamental forest trees, shrubs, Conifers, and fruit trees in every stage of development. About fifty acres constitute what may be called the home nursery, and another fifty occupy a sloping hill-side at Exminster, about three miles off, the

beauty, as they advance in age. Over the late Mr. Pince's tomb is a costly monument, but a still handsomer one to his memory is to be found in the many grand trees which he here fostered and loved during a long and useful life. A pair of Wellingtonias are about 40 feet in height, well-furnished and perfect to the very base. Some idea of the character of these importations from the West may be gathered from the fact that their trunks, at a foot above the ground level measure fully $4\frac{1}{2}$ feet in diameter, or nearly 14 feet in circumference. One of the most perfect Araucarias we ever saw, not even excepting the large one at Dropmore is here branched to the base. It is about 30 or 35 feet in height, and promises to make one of the finest trees in the country. The tawny gravelly soil round Exeter seems to suit this tree admirably, for we noticed many of the specimens which had accidentally lost their lowest branches breaking out into growth again within a foot of the ground level. Here is also one of the oldest specimens of *Cephalotaxus Fortunei* in England. It is 8 to 10 feet high, and was given to Mr. Pince by Mr. Fortune himself. *Thuja gigantea* is here fully 20 feet



Lapageria rosea on an open wall in the Lucombe Nursery, Exeter.

latter being principally devoted to the more common kinds of Conifers, such as Larch and Spruce, and to hardy evergreen and deciduous shrubs. The late Mr. Pince was a great admirer of fine trees, and the chief adornments of the home nursery consist of splendid specimens of Oaks, Wellingtonias, Cupressus, Araucarias, Piceas, and Thujas; and it also contains a very complete collection of green and golden Yews. At the principal entrance to the nursery is a splendid specimen of the Lucombe Oak (*Quercus Cerris* var. *Lucombiana crispa*), having a massive trunk, about 9 feet in circumference, which is clear to a height of about 12 or 14 feet, where it branches into an ample head of deep glossy foliage. Even in winter this is a noble tree. In general character it is intermediate between the Holm and Turkey Oaks, but the bark is more cork-like than that of either of these kinds. To the left is a remarkably fine Cork Oak (*Quercus Suber*), in vigorous health, and between the two stands a handsome purple-leaved Beech, the dark purple—almost black—foliage of which contrasts well with the varied greys and greens afforded by that of the Oaks. The rich beauty of these three choice specimens must make all who see them long for a few inches of soil in which to plant such trees, seeing that they always advance in

high, and specimens of *Cupressus macrocarpa* and its allies, *C. Lambertiana* and *C. Goveniana*, are equally fine. The upright or spiral Golden Yew is represented by two splendid trees 12 or 14 feet high, and a pair of the upright Italian Cypress, graceful as Bamboos, are fully 20 feet high. *Abies Pinsapo* does well here; the largest specimen is 30 feet in height, the growth being beautifully coloured; while *A. nobilis* and all the choicer Firs seem equally at home. Conifers are every year raised from seed by the thousand, and in looking over the beds it is surprising to note the variation observable in the young plants. In a plantation of Lawson's Cypress alone we picked out half-a-dozen well-marked forms, each distinct either in habit, density, or colour. The common dark-foliaged form is most common, but there is a spiral form of a fresh and much lighter green tint nearly as dense as *Thuja aurea*. Another variety, again, is quite glaucous—nearly silvery; in fact, there are white and yellow variegated forms, and others that differ greatly in habit of growth. The different varieties of the common Yew, again, are well-nigh endless—from dwarf dense masses, only a few inches in height when fully developed, to the towering spiral forms, and the sombre-branched common or native Yew, as seen in country church-

yards. Even taking such a plant as the Laurel (*Cerasus Laurocerasus*) as an example of variety, there are four distinct forms grown here in quantity; the common Laurel; its creamy variegated variety; the Colchican Laurel, which is best adapted for bleak and exposed positions; and the Round-leaved Laurel (*L. rotundifolia*), perhaps the most distinct, and best worth growing as an isolated specimen in the shrubbery border or on the lawn. Its foliage comes nearer in form and size to that of *Magnolia grandiflora* than that of any other shrub, and it is of the same fresh, glossy, green colour. *Berberis* (*Bealii*) *japonica* is grown here by the acre, the foliage being remarkably fine, and in some cases beautifully variegated with creamy-yellow and brownish-crimson. The immense collection of Oaks grown is surprising, and includes all the most effective species and varieties, such as *Quercus coccinea*, *Q. Cerris*, *Q. Suber*, *Q. Ilex* and its numerous long and short-leaved forms, *Q. heterophylla*, no two leaves of which are alike; *Q. Fordi*, one of the best of the evergreen varieties, and something like a *Phillyrea* in habit; it bears cutting well, and forms very compact pyramids; *Q. palustris*, *Q. seneciofolia*, or Groundsel-leaved Oak, with curiously-cut foliage, the under sides of the leaves being of a bluish or glaucous tint, which gives it a distinctive appearance. Elms, Limes, Chestnuts, Beech, Planes, Acers, Willows, and other deciduous trees, are equally well represented.

Rock Garden.

Here we have another feature which should never be wanting in gardens of any pretensions as regards completeness. In some respects this rockery might be compared with that of Messrs. Backhouse, at York, and yet it possesses a character peculiarly its own. The garden was constructed under the personal superintendence of the late Mr. Pince, and the result is highly interesting, as nearly every jutting crag or rounded boulder affords root-hold or shelter to some distinctive kind of vegetation. The paths wind effectively under sombre Yews and other evergreens, and here and there open spaces, trickling rills, and limpid pools afford room for the more hardy exotic plants that require shelter, and for marsh plants or aquatics, and Ferns of various kinds. In some places the rocks are draped with *Linaria* in a peculiarly effective manner, and one can scarcely recognise the half-starved little wall plant in its long streaming wreaths of fresh green foliage, as it here hangs gracefully from a jutting boulder or little rocky promontory. The variegated variety of Fortune's Bamboo (*B. Fortunei*) grows luxuriantly here, some of the stems being fully 2 feet in height, and the foliage far better developed than is generally the case when this plant is cramped in pots. In company with evergreen *Polypodiums*, *Polystichums*, and *Lastreas* this plant is very useful, as its silvery leaves contrast well with the darker shades of green. Another even more elegant and stately species, *Bambusa gracilis*, luxuriates in one of the sheltered spaces, and, even in December, is an object of much beauty. Planted by ponds or streams in the many warm and sheltered dells to be found south of London, this graceful plant would always charm the eye. It would revel in the humid and Fern-fringed glades of the Isle of Wight, and even in less-favoured localities it might be made one of the finest features in the cool conservatory or winter garden. There is a fine plant of it in the Chelsea Botanic Garden, and there should be one even finer in the well-kept temperate-house at Kew. Another distinct plant met with here, which produces excellent effects in juxtaposition with massive sombre-tinted Conifers, is the White-washed Bramble (*Rubus biflorus*), each stout stem being white, as suggested by the popular name. It thrives here with unabated vigour, and its bright appearance is greatly enhanced by the dark-leaved Yews and Firs around it. A specimen of the Maiden-hair Tree or Chinese "Ginko" (*Salisburia adiantifolia*) towers upwards to a height of between 40 and 50 feet, its spiral or slender conical habit contrasting well with flat-headed Cedars and dwarf Firs. Here is another open space and a charming group of sub-tropical plants, consisting of *Arundo Donax*, *Bambusa gracilis*, Pampas Grass, with elegant curling leaves and feather plumes of burnished silver-like hue, sword-leaved Yuccas, *Ruscus racemosa*, Ferns, and other distinct-habited plants, while here and there the fresh green drapery of the rocks is enlivened by variegated *Euonymus*

and Ivies. The sheltered position of this charming garden makes it a cosy home for many rare and beautiful Conifers, a class of plants in which the Exeter nurseries are second to none in the kingdom. Among these are *Cephalotaxus Fortunei*, *Thujopsis borealis* (a fine specimen, 30 to 40 feet high) *Cupressus Lawsoniana argentea*, a fine and distinct silvery variegated form of Lawson's Cypress, *Torreya myristica* and its ally *T. horrida*, a columnar-habited plant with sharp-pointed, almost spinose foliage. Both species are very ornamental and deserve culture in select collections as beautiful souvenirs of a good botanist, and a useful man. Here are some fine fresh hemispherical masses of the dwarf *Abies* (*Picea*) *Clanbraziliensis*, and a plant of the curious drooping *Abies monstrosa* is worth notice. Green and golden fastigate Yews seem here quite at home. The uses for a rock-garden like that here described are twofold. Sheltered from rough winds and nipping early and late frosts, many tender plants here present a fresh and luxuriant appearance unattainable on the open lawn or shrubbery borders, while during the broiling hot days of summer, when shade and retirement are so desirable, a garden of this description affords, if well designed, scores of shady nooks, dells, little glades, and overhanging bowers, where one can read or study undisturbed.

The Italian Garden.

This, as its name implies, is a portion of the extensive ground set apart for Conifers, flowers, and foliage plants, arranged in a somewhat formal or geometrical manner, in oblong beds, among which some handsome vases are interspersed with excellent effect. Down the centre is a wire-covered walk, over which climbing Roses, Clematis, Honeysuckles, and other suitable plants are trained. The Japanese Honeysuckle (*Lonicera brachynema aurea variegata*) flowers and fruits freely here, the latter being rather a rare occurrence in English gardens. During the summer and autumn months some excellent results are obtained by a judicious use of bedding plants, by which bright shades of colour are obtained, and these are duly balanced and harmonised by a plentiful sprinkling of sub-tropical plants and dark green shrubs and Conifers. Here are some admirable examples of dwarf hemispherical Golden Yews, and others of a dark green fastigate form for contrast, together with fine rounded masses of the dwarf *Abies Clanbraziliensis*. Among sub-tropical plants used here, *Arundo donax* was very ornamental even in December, forming great tufted masses, the tallest stems being 12 feet in height; some of the great-leaved *Solanums* were also quite fresh, and *Cineraria maritima* was as silvery as ever. The vases are furnished with Yuccas during the summer months, Yuccas being better fitted for such a position than bedding plants, and plenty of colour is obtained in the beds below. We here noticed some fine standard Portugal Laurels in tubs, their semi-hemispherical heads being faultless in shape. Two splendid specimens were presented to the Royal Botanic Society's Garden, Regent's Park, some time ago, by Dr. Woodman, and have there been much admired.

Stove and Greenhouse Plants.

A fine stock of tropical foliage and flowering plants is cultivated here, some of the specimens being remarkable for their health and vigour. At the time of our visit a little lobby at the entrance to one of the Orchid-houses was gay with different varieties of *Epiphyllum truncatum*, one of the best and most useful of all winter-blooming succulents. The plants here were worked on the *Pereskia* stock, which elevates them 9 or 10 inches above the rim of the pot, and gives to them a far more elegant appearance than they possess when grown on their own roots. Here, also, *Gesnera cinnabarina* was very showy, the growth being very robust and healthy, and the flower-spikes of large size. This makes a very showy winter-blooming plant if the tubers are potted in rich sandy soil and grown on in a warm and equable stove temperature. The reason so many growers fail to flower it satisfactorily is, doubtless, owing to some irregularity in temperature or moisture at the root. What most surprised us, however, was a number of *Bougainvillea glabra*—small plants, little over a foot in height, blooming freely in 48-sized pots. These were very conspicuous on account of the delicate and peculiar mauve

colour of their floral bracts, which are quite distinct from anything else, and invaluable for bouquets and other decorations during winter. The main secret in their culture is to strike cuttings early in the spring, and to grow them on in small pots close to the glass in a moderately warm stove. This induces short-jointed and not over-vigorous growth, which rarely fails to produce flowers at this season. Standing in a shallow tank of tepid water in the Orchid-house was one of the finest specimens of *Higginsia* (*Camphylobotrys*) *refulgens* we ever saw—a splendid and vigorous mass, fully 4 feet through. This is a very old and neglected stove plant that is unsurpassed for richness of colouring when well grown, and in this specimen the rich velvety greens, browns, and purples were especially well developed by good culture. *Marantas* do remarkably well in the same house; a plant of *M. Veitchii* was 3 feet in height, and well furnished with richly-tinted foliage. *M. rosea-picta* was revelling here, some of its leaves—blade and stalk—being over 2 feet in length, the leaf itself being quite 10 inches broad, and very vividly coloured. This plant is of a very pleasing metallic-green tint, quite distinct from any other plant we know, and deserves culture on account of its distinctive peculiarity. *M. illustris* was equally luxuriant, and a fine specimen of the old but, as yet, unsurpassed *M. (Calathea) zebrina* was a mass of rich green and black-striped foliage. In the long stove two plants of *Anthurium regale* were making a very vigorous growth. This is an effective exhibition plant when well managed, but unfortunately it travels badly, the young foliage being as delicate as it is beautiful. Here are also several fine specimens of *Clerodendron Balfourii* trained on globe trellises, and also three or four equally fine strong plants of *Stephanotis floribunda*, fresh and healthy, but of course not in flower. One of these plants bore over 100 fine clusters of flowers, all open at once during the past season, and was much admired, it having been exhibited at the Plymouth Horticultural Society's Exhibition. On one of the side benches we noted hundreds of small decorative Palms, and a fine young stock of *Stephanotis floribunda* in small 60-sized pots. In this house, and covering some 30 or 40 feet of the roof, is one of the finest plants of the old, but too rarely seen, *Hoya imperialis* that could be found in this country. Even when not in bloom, its extremely vigorous growth and great leathery foliage, are quite sufficient to attract attention to it as a stove climber. This plant is now showing quantities of flower buds, and is worth a place as a winter-bloomer. At the lower end of this house are numerous specimen foliage plants, including fine examples of *Alocasias* and *Anthurium magnificum*, in habit resembling *A. regale* previously referred to, but whose foliage is rounder and scarcely so elegant in shape. Here also are four or five little cases devoted to a small collection of *Anætochili*, including nearly all the more common kinds. It is a pity these plants are not more generally grown in plant-stoves, for few foliage plants are more beautiful. When closely examined, each leaf will appear like a velvet cushion richly embroidered, and marked with gold, crimson, yellow, or bronze. We here noted a splendid specimen of the extremely rare Fan-leaved Palm, *Prichardia pacifica*, with twelve fine drooping fresh green leaves. This is valuable for exhibition purposes, being distinct in form and of compact habit of growth. In another plant-stove we found a vigorous specimen of *Psidium Cattleianum* (the purple Guava), which is just now profusely covered with fruit. A sunk pit in the centre of this house is devoted to tall-growing specimen Palms and tree Ferns; among the latter were fine plants of *Cibotium regale* (a species remarkable for the rufous, hair-like covering at the base of the stipes), *Dicksonia antarctica*, *Cibotium princeps*, *Cyathea medullaris*, and a noble plant of *Livistona borbonica*, remarkable for its ample, fresh, green, fan-shaped foliage. *Gleichenias* do well here, two fine specimen plants of the deep green *G. dicarpa* and the glaucous-tinted *G. Speluncæ* being especially noticeable for their freshness and beauty. These rare Ferns are valuable, either for show purposes or for supplying choice fronds for the very finest of bouquets and floral decorations. We also noticed good specimens of *Cocos Weddelliana*, *Phœnicophorium sechellarum*, and *Verschaffeltia splendida*, with its stem and canopy of ample foliage supported a foot above the soil of the pot by the stout buttress-like aerial roots. *Ixoras* are a speciality

here, and very fresh and healthy they look just now, without any marked traces of the well-known spot, which, if once it gains a footing, so soon destroys the beauty of the plants. Here we noticed fine specimen plants of *I. Colei*, *I. coccinea*, *I. javanica*, *I. amboynensis*, *I. Williamsii*, *I. Prince of Orange*, and other equally well-known forms of this grand old genus. Here, also, we noticed a remarkably fine specimen of the new *Dipladenia Brearleyana* in first-rate condition, promising well for next year's exhibitions; and, beside it the new *Anthurium floribundum*, a white-spathed variety, is blooming freely, as implied by its specific name. Here, also, we noticed a fine-foliaged plant labelled *Coccoloba* sp? a strong-growing shrub, reminding one of a broad-leaved *Ficus* in habit. This is distinct and new, promising to become, when better known, a highly ornamental decorative foliage plant. Finely-coloured plants of *Croton majesticum* and *C. Johannis* stand here close under the glass, and some fine globe-shaped specimens of the brilliant orange-scarlet *Rondeletia speciosa* were flowering very freely. One of the small range of span-roofed houses here is devoted mainly to the growth of specimen *Crotons*, among which are some very fine highly-coloured examples, varying from 2 to 3 feet through. Among the varieties here may be noted *C. irregulare*, *C. undulatum*, one of the best; *C. Hillianum*, an improvement on the old *C. pictum*; *C. aucubæfolium* and *C. maximum*, with large-sized golden-blotched foliage; *C. angustifolium*, *C. pictum*, and, of course, the old but beautiful *C. variegatum*. A plant of *C. Wisemanii* had just returned from the Manchester Exhibition, and was of the most brilliant golden colour imaginable. This is perhaps the finest of all the new *Crotons*, and deserves to be grown in all collections of fine foliage plants. In one of the stoves here we noticed a fine batch of *Eucharis amazonica*, which is here largely grown as an exhibition plant, and also for its pearly white and sweetly perfumed flowers.

Orchids.

These beautiful plants are well represented, and are in a fresh and healthy condition, many of them being now in bloom. Three or four fine specimens of *Angræcum eburneum* are throwing up their flowering stems, and on one plant we counted four of these nearly as thick as one's little finger. *Aërides odoratum* does remarkably well, and is represented by dozens of healthy plants. A fine plant of *Cymbidium giganteum* bore an eleven-flowered spike at the time of our visit. We also noted several good plants of the yellow-flowered *Dendrobium densiflorum*, and *D. chrysotoxum* and *D. aggregatum majus* seem to do well. A batch of imported *Vandas*, including *V. Bensoniæ*, are growing freely. A choice collection of *Phalanopsis* occupies one end of a house here, and the plants seem perfectly at home, the leaves being remarkably plump and fresh, and their roots clinging vigorously to the baskets and pots in which they are grown. Many plants of *P. Schilleriana* are now throwing up stout flowering spikes. Several plants of the *Flor del Meurtos* or *Oncidium tigrinum* are doing excellently; and a batch of *Calanthe vestita rubra* and *C. v. lutea oculata* are now blooming freely with the soft, rosy, lilac-flowered *C. Veitchii*, a plant well worth growing by the dozen in every plant-stove where winter-blooming plants are desired. *Cypripedium insigne* is another old favourite that does well even in a warm greenhouse, and flowers regularly during the autumn and winter months. We noticed some strong plants of the Australian Rock Lily, *Dendrobium speciosum*, growing well, together with the vigorous *D. Calceolare*, a most beautiful plant when in bloom, and of a robust habit if liberally treated; indeed, it is one of the few Orchids to which liquid manure may be supplied during their growing season with advantage. In the cool Orchid-house we found *Odontoglossum Alexandræ* and *O. Uro-Skinneri* growing very freely, and the fine old *O. grande* was flowering well, bearing five or six great golden-yellow brown-blotched flowers on a spike. This is another plant that will succeed perfectly in any moderately warm plant-stove if properly supplied with fresh air during summer. The same may be said of a plant of the old *Oncidium flexuosum*, which was laden with its pale-golden flowers. One of the small houses here is devoted to the culture of *Lælias*, *Cattleyas*, *Dendrobes*, *Coelogyne cristata*, and other intermediate-house Orchids; and here we noted an ingenious and useful contrivance, which is

well worth general adoption elsewhere, especially in localities where there are mineral impurities in the soil which renders the supply from wells, &c., almost useless for plant culture indoors. In the centre of the house is a bed or pit about 3 feet in height, and inside this is a cemented tank capable of holding many thousand gallons of rain-water, which, instead of being allowed to escape in the usual way, is here conducted into this tank or reservoir, from which it can be drawn into a smaller tank below the level of the floor as required, the last-named tank being large enough to "dip from" with the watering can, and thus save time. The top of this reservoir is slated, and thus forms a stage on which the plants are arranged. It is a well-known fact that rain-water is the best for plant culture, and tanks constructed like that just described, or even excavated below the surface of the floor, are much to be recommended.

The Glasshouses.

The conservatory or show-house for ornamental-flowering and foliage plants is fully 150 feet in length by about 14 feet in width. Here we found a brilliant show of Chrysanthemums, Cyclamens, scarlet Pelargoniums, well-bloomed plants of the crimson-scarlet *Schizostylis coccinea*, and numerous other well-known winter flowers. We also noted some fine densely-furnished specimens of *Libocedrus Donniana*, one of the freshest and greenest of Conifers, and one which succeeds well under pot culture if liberally supplied with water at the roots. A fine specimen of *Chamærops excelsa* var. *argentea* in this house, too, was remarkable for its slender fan-like foliage, which, instead of being green, as in the normal form, is in this variety of a silvery hue. At each end of this conservatory is a choice collection of succulents, and the roof is well furnished with the best climbing and trailing plants. *Tacsonia Van Volxemii* was fruiting freely; and, singular enough, some of the leaves at the apex of the young growth were simply cordate-ovate, slightly woolly beneath, as in *T. insignis*, and not, as usual, ternate. Other climbers, as *Rhynchospermum*, *Passiflora racemosa* (the latter beautifully in flower), and *Jasminum revolutum*, luxuriate here and produce plenty of cut bloom. Both the red and white-flowered forms of the *Lapageria* are quite a speciality here. Some may not know that there are, at least, half-a-dozen distinct forms of the common *Lapageria rosea*; indeed, the plant is an extremely variable one, not only as regards size and colour of the flower, but also in habit of growth and size of foliage. In some varieties the flowers are so deeply coloured that the white blotching and mottling inside are nearly absent, and the flower has a closed appearance. Others have large pale white blotched segments, which expand in a bell-like manner at the mouth, and these varieties are very beautiful when trained on a roof and looked at from beneath, while the closed but rich coral-red or crimson flowers look best on a wall or when viewed horizontally. We imagine that but few cultivators, even in the sunny south, regard this beautiful plant as a hardy climber; but, in sheltered positions, we have known it to withstand severe winters as far north as the Trent when carefully mulched or otherwise protected at the root during frosty weather. Mr. Lamb planted out some specimens of it in the grounds at Colston Bassett, Nottinghamshire, a few years ago, and these succeeded moderately well. Here, in the Exeter nursery, a specimen literally luxuriates on the outer wall of the conservatory, making even finer and stouter growth than plants indoors. Last December, when we saw it, it was flowering profusely, and a few weeks

previously it had on it upwards of a hundred flowers. Our illustration is prepared from a photograph, and gives an exact representation of the plant. We have often received flowers of this plant from other favoured spots in Devon, and from the Isle of Wight; but we question whether there is anywhere a finer specimen growing out of doors than that to which we have just alluded. A vigorous specimen of the white variety was blooming freely, planted out in a cool Vinery, and promises to soon cover the back wall. The Camellia-house (200 feet long) is a striking feature, the plants being splendid specimens, which are rivalled only by those in Mr. Scott's conservatory at Sundridge Park, or the fine old examples at Chatsworth. The finest specimens, principally double whites, are planted out in the central bed of the house, and are fully 20 feet high, and nearly as much through, and these, at the time of our visit, were profusely covered with flowers and buds. The old Double Whites, *Candidissima* and *Fimbriata*, are, perhaps, best worth culture where cut flowers are desired, white flowers being nearly double the price of the coloured kinds in the market. Some plants are in large tubs, and the side walls present a very beautiful appearance, being covered

with a dense sheet of glossy green foliage and with a profusion of flowers. This house is another striking illustration that wherever practicable it is by far the best plan to plant out Camellias in positions where they can fully develop themselves, especially if cut flowers in quantity are desired. Other houses are devoted to Pelargoniums, *Ericas*, Camellias in pots, Indian Azaleas, Gardenias for cut flowers and bouquet making, and one house is nearly filled with strong plants of the fragrant flowered *Eucharis amazonica*. A new span-roofed house has just been erected for Tea-scented Roses, and is already planted with *Maréchal Niel*, *Safrano*, and other leading varieties.

Fruit-houses.

Two long pits are devoted to Pines, and contain a healthy stock of clean and vigorous fruiting and succession plants. There are also several fine ranges of Vineries and Peach-houses, the produce being in most cases gathered before the time of our visit, with the exception of a house of Mrs. Pince's Black Muscat—a well-known late keeping Grape of a very delicate flavour, and well worth a place in the most select collection of late Grapes. It is equal to Lady Downe's Seedling in keeping qualities, while its flavour is fully equal to that of Snow's Black Muscat, and it sets more equally than the last-named variety.

The Propagating Department.

As may be imagined in a nursery of 100 acres, with a small village of glass-houses, this is a very important department. In the propagating houses (parts of which have been lately remodelled by Dr. Woodman, to afford increased facilities for the supply of new and rare Conifers and choice exotic plants), we found everything in perfect order. Among a whole host of other things, Tea Roses were being propagated by the hundred—we might almost have said thousand—at the time of our visit. The stocks used are the Manetti and seedling Briar. What most struck us was the skill shown in grafting these. Scions and stocks are selected of equal thickness, a sloping or whip-graft cut with a keen blade, and the stock is ready. Another cut forms the base of the scion, and the two are fitted together accurately in far less time than it has taken us to describe the process, and lashed firmly in their places by a few turns of bast, no tonguing being resorted to. This is the quickest and simplest form of Rose grafting we have



A well-grown dwarf Palm.

ever seen. New Azaleas and Camellias we found by the hundred treated precisely in the same way, and the union between scion and stock soon takes place in a humid case. Among other rare plants freely propagated here we were glad to see the coral-berried *Nertera*, a charming plant, rare in both gardens and nurseries. Some of the rarest and best of the *Gymnogrammas* are being freely multiplied from spores, such as the silvery *G. peruviana*, a specimen plant of which measured fully 3 feet through; another plant of the bright golden *G. Lauchiana* being even larger still. Here, also, we found a splendid stock of *Pelargoniums*, including most of the novelties obtained by Turner, Cannell, and other raisers and growers. Many of the rarer *Conifers* are here propagated by grafting, as well as from seed. There is a needless prejudice entertained by some growers against grafted *Conifers*; but we have it on the authority of Mr. Fowler, who has formed one of the most striking of all private collections of *Coniferæ* at Castle Kennedy, that grafted plants are fully equal there to the same kinds raised from imported seeds. Some of the grafted specimens at the last-named place have themselves borne perfect cones; and seedlings from these, again, are as healthy and as vigorous as those from seeds sent by collectors in the Rocky Mountains, Japan, and elsewhere. Among the kinds propagated by grafts, we noticed *Abies firma*, *Picea amabilis*, *P. nobilis*, *Cupressus Lawsoniana argentea*, *C. torulosa*, *Abies Pinsapo* var., and lastly but by no means least, the curiously whorl-leaved Umbrella Pine of China and Japan (*Sciadopitys verticellata*). One of the most common of stove plants, the crimson and purple-flowered *Ipomœa Horsfalliæ*, is here readily propagated by grafting it on the fleshy roots of other species, as *I. Learii*. *Wistarias* and Moutan *Pæonies* are grafted on their own roots as the readiest plan, although *Wistarias* root freely by layering, and we have repeatedly struck Moutan *Pæonies* from cuttings of the young growth, leaving on a heel of the old wood. Among other hardy subjects propagated in quantity we found hundreds of healthy plants of the true Exmouth *Magnolia grandiflora*, which is, perhaps, the best of the whole group. During wet, or unfavourable weather many of the hands are employed in extracting the seeds from Pine and Fir cones, and in preparing other tree and shrub seeds for sowing. Stocks for Plums, Cherries, Apples, Pears, and Apricots, we found by the hundred ready for operations in the spring. Quince stocks are largely used for bush Apples and Pears, Muscle stocks for Plums and Peaches, and Brompton stocks for Apricots.

Roffea Grass.—I agree with Mr. Hobday (see p. 295, Vol. V.) that for tying plants this material is much better than common matting or twine. It is strong and tough. It may be used for tying all kinds of plants, Vine rods, Vine shoots, &c. It is soft and pliable, and, therefore, offers no hindrance to the free expansion of young and tender growths. It is sold by weight by nurserymen, and is much cheaper than twine, or cutting up a good mat for tying purposes which I have often seen done.—J. MUIR.

THE INDOOR GARDEN.

PALM CULTURE.

PALMS have now become universal favourites, and their popularity is such that they are no longer confined to extensive collections in large horticultural and botanic establishments, but have been introduced, through nurserymen, to decorate and enliven the apartments and assembly rooms of our cities. There is a strongly marked individuality about this order of plants which strikes even the ordinary observer, and the effect produced is all the more heightened when large and small specimens of various species are grouped together, and also when they are associated with tree Ferns,

Cycads, Bananas, Marantas, Caladiums, and various forms of a more or less tropical character. Their symmetrical appearance, their fan-shaped and pinnate leaves, the charming shades of green which they assume, the graceful curve of the leaf-stalks, the rugged appearance of the stems, the development of the flowering process on a spadix, their intrinsic value and durability all combine to raise them in public estimation. Their culture is attended with little or no difficulty, and yet to produce and preserve healthy well-developed specimens much attention and labour are requisite. The soil should consist of a good free fibry loam, and when intended for plants in a young root-forming condition, it should be thoroughly disintegrated with the fingers, and combined with a quantity of older mould of the same description, together with an admixture of sand. If good balls of roots are already formed, the potting material may be more roughly dealt with, and may contain less decomposed material. As these plants succeed admirably with small shifts at long intervals, it is the more necessary that a large proportion of fibre should be present in the soil, inasmuch as the mass will thereby take longer time to decompose and get exhausted. It will, moreover, form a better rooting medium, keep more porous, and so minister better to the sustenance and structure of



A well-grown dwarf Cocos.

the plant than it would otherwise do. In the process of shifting, the points to be observed are, limitation of root-space, which should in no case exceed 6 inches, and this only for such as have attained large dimensions in tubs or boxes; efficient drainage to prevent choking up, until the roots find their way among the corks. To secure this, rough pieces of turf should be laid in the bottom of the pit or tub previous to filling up with soil. The whole should be made sufficiently firm by packing the soil carefully with a rammer. Thus a large amount of turfy material will be compressed within a small compass, thereby increasing its stamina. The best time for this operation is after the plants have made their season's growth, and before they go to rest; but it may also be performed during spring, care being taken that the roots are not mutilated so as to impair their action. A good margin or basin should be allowed for water, which

should be freely administered; the indispensable condition of success in Palm growing is abundance of moisture at the roots, and more or less in the atmosphere. If Palms are stinted as regards water supply, during their period of activity, the foliage, instead of wearing that freshness and lustre, so pleasant to the eye, speedily assumes a parched and sallow complexion, and the growing power of the plant receives an unwholesome check. Neither should they be subjected, while dormant, to the drying-off process, as it is termed, for, though less impatient of drought in winter, they cannot long be subjected to the influence of fire-heat without water with impunity. Another and most essential provision with reference to health and vigour, is shade. Where considerable numbers are grown, the capacious leaves of such as have attained goodly dimensions will furnish an awning to their less stately bretheren; but those which are directly exposed to the sun's rays must be shaded, either by means of stained glass, temporary screens, or, better still, a judicious combination of stone and glass in the construction of the house. By such means, the water will be utilised by reducing the evaporation to a minimum, and a moist atmosphere be steadily retained, provided that the syringe is plied daily. In order to counteract still further evaporation from the soil, the surface of the pots or tubs, especially those containing lately-shifted plants, should be mulched with living Sphagnum, or whatever may be deemed suitable. Another measure conducive to the well-being of the Palms is cleanliness, a condition dependent upon the regular employment of the garden engine, syringe, soap, and sponge. The accumulation of dust or other impurities on the leaves impairs healthy leaf action. War must constantly be waged against scale; or, rather, the policy that prevention is better than cure should be adopted. The appearance of this pest is frequently the result of starvation, or uncongenial treatment of some sort. Extreme fluctuations of temperature should be avoided, but I would not advocate high temperatures. Plants in which growth has been solidified by a due admission of light and air, will winter in a minimum temperature of 45°; but where they are intermixed with a miscellaneous assortment, it will be advisable, as a safeguard against cases of damping off, not to let it fall below 50°. The seeds of Palms require a high and steady bottom-heat. The Date, however, may be raised in an ordinary greenhouse. *Seaforthia elegans* is often found springing up self-sown at the bottom of the parent stem—a fact which would indicate that Palm seeds should be covered lightly, and also that they should be sown as early as possible after they are ripe. In the arrangement of Palms, whether temporary or permanent, each should be allowed room sufficient to show off its outline to advantage; with plenty of room, too, that flabby pent-up character is obviated which crowding always entails.

J. S.

ORCHIDS WITHOUT ORCHID HOUSES.

THE extended cultivation of these plants is greatly retarded on account of the erroneous impression that separate houses are required for each distinct class, and the error is one by which the owners of plant-houses are made to lose one of the greatest charms that their glass structures ought to afford them. I do not wish it to be understood that they can be grown better in the mixed style than in a separate house; but I wish to convey an idea of the enhanced effect that is given to their lovely flowers by contrast with the magnificent foliage of *Musas*, Palms, Tree Ferns, *Alocasias*, &c. The majority of aerial Orchids, suitable for stove-houses, delight in the shade of overhanging foliage, and may be grown between the specimen plants and roof-climbers in space that could not be utilised except for basket plants, when, with their bloom hanging in the best position for minute observation, they will at all times prove objects of much interest. I will simply give our mode of cultivating that queen of Orchids, *Phalænopsis amabilis*, which will be found to answer for most kinds requiring a high moist atmosphere. For economising space, we grow these Butterfly plants in rustic baskets, made with rough-barked wood and pieces of copper wire, of sizes to suit the specimens. These are hung on wires stretched from one rafter to another. The compost we use is fresh Sphagnum Moss with a little charcoal, peat, or potsherds; but the main point of success is a high moist temperature, such as suits fine-foliaged plants, for these aerials live on the atmosphere more than on the compost they are in. During summer we keep the central beds of

stoves filled with water, which constantly gives off vapour. In winter we find sprinkling the paths and surfaces of beds sufficient as the blooms last longer without spotting in a drier atmosphere than that maintained in the growing season. The temperature in which we find them do best is a mean of 65° for winter and 75° for summer. If at any time the plants are exposed to a heat much below 60°, except for a short period, their leaves soon assume a sickly yellow hue; and, although not easily killed, they are slow to recover from injury. As regards freedom of bloom, I do not think we have any plant that produces such a display throughout the whole season as *Phalænopsis*, which are always in bloom. On plants in baskets less than 6 inches square we have several with from fifteen to twenty fully expanded blooms, from 3½ to 3¾ inches across. As the spikes of this variety continue to produce successional batches of bloom, I have, sometimes, as soon as one lot begins to fade, pinched the terminal bud off, so that the plant might not exhaust itself, but in a few days they invariably send out two or three branched lateral spikes, producing about six or eight flowers, which are invaluable for cutting, for ladies' hair, button-hole bouquets, &c. We have had all through the winter upwards of one hundred expanded blooms in one stove. Mingling and contrasting admirably with them are long sprays of *Passiflora princeps*. The foliage plants beneath look all the better for their lovely flowers, while they in return get the benefit of the foliage. Do not then range them in rows like Cabbages, in houses by themselves; but grow them as they are grown in their natural state, where they are found garnishing the stems of giant trees, and festooned with entangling creepers; although somewhat expensive at first, they do not lose, but yearly increase in value as they do in size, which cannot be said of all plants.

Henham Garden.

JAMES GROOM.

Treatment of Small Seeds.—I believe small seeds more frequently fail to germinate after they are sown than large ones. Various reasons might be assigned for this, but I think the principal cause lies in the manner in which small seeds generally are treated, especially those sown in pots and pans. The latter are in most cases filled very loosely with open soil, and rendered extremely porous by the application of large quantities of leaf mould and Mushroom-dung. Upon the surface of this the small seeds are then strewed, and a good watering is forthwith administered. This, undoubtedly, has the effect, in nine cases out of ten, of carrying the greater part of the seeds far down into the open mixture, where they have but the remotest chance of germinating. Should they do so, there is so much length of young and tender stem between the root and the surface of the soil that the young plants damp off before they are many days above the ground. Such failures are seldom attributed to mismanagement, but usually to bad seed. The plan I have adopted with perfect success is to have the surface of the soil, where the seed is to be placed, composed of the finest-sifted matter, through which the seed will not easily pass. When the seed is sown, I never give a drop of water on the surface, but let the pot or pan into a flat filled with water. The soil soon gets moist, while not a single seed is shifted from the position in which it was originally laid; and I never have occasion to suspect the quality of the seed. The flat is not kept constantly filled, but supplied with water as required, and this should never be given on the surface until the young plants are well up. There is another practice I have often observed in sowing seeds—that of filling the space between the soil and the rim of the pot so full of water as to flood the seeds, when they are nearly all washed on one side. When these germinate they often come up so thickly as to smother each other, and much damping usually follows. This tends directly to spoil seed and plants; on the other hand, the flat system saves both, and may be successfully practised by all. Those who cannot afford to get a common garden flat may use an old tea saucer with the same practical results.—J. MUIR.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Lapagerias from Seed.—How should I proceed to raise a few seedling *Lapagerias*?—DELTA. [Sow in pots or pans filled with light soil, as soon as the seed-pods are fit to be taken from the plant; place them in a temperature from 60° to 65°, and keep them well soaked with water. They will come up about a month afterwards, and will not then require so much water. If properly treated, they will flower during the second year.]

Begonia ascotiensis.—A fact little known (says the "Revue Horticole") is that this *Begonia*, so common and turned to such good account with us, is scarcely known in England, although it originally came from there, M. Keteleer having a few years ago bought it of Mr. Standish, of Ascot, for half-a-crown. Messrs. Thibaut and Keteleer sold such plants as they raised of it at an equally reasonable rate, and it was not until last year, when M. Duval was awarded a prize for some fine specimens of it, that its value became apparent. Plants of it, which at one time could be bought for a shilling or little more, now realise as much as twelve francs or half-a-sovereign.

PROPOSED EMBELLISHMENT OF THE ORMES HEAD.

THE scheme for planting and laying out in an artistic manner the noble Welsh headland called the Great Ormes Head (to which allusion has been lately made), is so important a one to the horticultural public, as well as to tourists and those who visit this, the most celebrated of Welsh watering places, in search of health and strength, that I trust it may not be allowed to fall through for want of adequate support. If carried to a successful issue the beauty of one of the grandest and most picturesque portions of the mountain scenery of North Wales would be enhanced, and additional inducements held out to the public to visit the spot. I gather from the remarks to which I have referred that the scheme is at present in its initial stage, although your correspondent mentioned a limited liability company, which possibly is now in course of formation. As he alludes to obstacles that may be thrown in the way of the undertaking, it will be as well to consider what in reality they are. The chief one appears to be the infringement of manorial rights; and, doubtless, it would be very inconvenient to find, when the capital had been subscribed and the work commenced, that the lord of the manor—that most mysterious of all invisible magnates—had some insuperable objection to the scheme, and was empowered to act as he thought fit in the matter. Another drawback, for it can hardly be correctly named an obstacle, seems to be the apathy and indifference with which the local landowners have met the proposal. I am confident, however, that these difficulties are far from being insurmountable. It would be an easy matter to discover who the lord of the manor is, and what his claims are, and there can be no reasonable doubt that the satisfaction of the latter would be a less serious matter than has been supposed if a guarantee by the company for full compensation for any infringement of rights be given. It is possible, indeed, that the lord of the manor himself might be induced to become a shareholder, and thus have a direct interest in the success of the enterprise. So far as the inaction of the landowners goes it would be found that their co-operation would be secured so soon as they saw an influential body of men determined on carrying out the scheme. At present the headland is of little or no commercial value, and in no way enhances the prosperity of Llandudno or its neighbourhood. The proposed undertaking would have the effect of completely altering this state of things. If judiciously planted with trees and hardy and Alpine plants and shrubs of a dwarf growth, under the superintendence of leading men in the profession, the natural attractions of the mountain would render it of absolute commercial value, and who would object to pay a small charge for the pleasure of seeing it under so improved an aspect? The glorious Atlantic sunsets, to which your correspondent so graphically refers, and the wild and romantic inland scenery will be enjoyed the more when viewed from artistically-planted grounds, well furnished with rustic seats for the convenience of visitors. In my opinion a company is far more likely to manage the matter successfully than a private individual, even if one were found ready to embark £10,000 or £15,000 in such a scheme; and once enlist public opinion in its favour, and show that, apart from the aesthetic value of the work, it may rest on a solid commercial basis, such a company might readily be formed, and the necessary capital as rapidly supplied.

L. W.

The Cinnamon Tree.—This tree flourishes in a white quartz sandy soil, and in its cultivated state it is never allowed to exceed the dimensions of a bush, being pruned down close to the ground every year. This system of close cutting induces the growth of a large number of shoots, in the same manner that Withies are produced in England. Every twelve months these shoots attain the length of 6 or 7 feet, and the thickness of a man's finger. In the interim the only cultivation required is repeated cleaning. The whole plantation is cut down, and the sticks are then stripped of their bark by the peelers. The practice of the natives in this employment naturally renders them particularly expert, and in far less time than is occupied in the description, they run a sharp knife longitudinally along a stick, and at once divest it of the bark. On the following day the strips of bark are scraped, so as entirely to remove the outer article. One strip is then laid within the other, which upon becoming dry, contract and form a series of enclosed pipes. It is subsequently packed in bales, and carefully sewn up in double sacks for exportation. Although the Cinnamon appears to require no more than a common quartz sand for its production, it is always cultivated with the greatest success when the sub-soil is light, dry, and of a loamy quality. Cassia bark is much like Cinnamon, but thicker, coarser, stronger, less delicate in flavour, and cheaper; hence, it is frequently used to adulterate Cinnamon.—Baker's "Eight Years in Ceylon."

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Rhubarb.—There are few culinary plants more generally cultivated than Rhubarb, and it is deserving of special attention in the amateur's garden. Independently of its many uses, it is in itself, when well grown, a plant of very ornamental appearance, and, if the several crops of the kitchen garden be well grown and a systematic order of cultivation carried out, no weeds permitted to grow, or the remains of past crops allowed to cumber the ground, a vegetable garden may, and always should, be made not only useful but very pleasing to the eye. To grow Rhubarb well requires deep cultivation and rich land. It will live almost anywhere, even under fruit trees, but the produce in such places is weak and puny; yet it likes shade, and will succeed well under a north wall if the situation be in other respects light and open, and in such a position the individual leaves and stalks will attain the greatest size. If the bed be 3 feet deep in soil all the better; if not, an addition of decayed vegetable matter, such as Cabbage stalks and leaf soil, with one-third of road scrapings and one-third manure, well mixed with the soil in digging, will produce heavy crops. The principal advantages of this high culture, in the case of this and similar subjects is, that the produce is better in quality, and the space necessary for the production of a given quantity less in extent. Large growing kinds of Rhubarb, like the Victoria, should be planted with a space of 6 feet between the rows, and should be an equal distance apart in the rows. Every spring a good dressing of guano or soot may with advantage be applied. For early produce, a few roots should be planted in a warm south aspect. This should be an early variety, such as Linnæus; it may be planted 4 feet apart, and, if covered with a few inches of litter during the winter, it will throw up early. All flower-stems ought to be removed as soon as they make their appearance; and, in a private establishment, a method different from that practised in market gardens should be adopted in gathering Rhubarb. In the latter, the object is to gather all; that is, to strip off all stalks that are large enough, at once and early in the season, whilst the price is high. This hard stripping naturally weakens the plant, and causes it to produce a less weight of crop during the season than it would if the removal of the stalks was more gradual, as is the case where the plant is grown for home consumption. With a view to strengthening the plants after the spring pulling, when Currants and Gooseberries get plentiful, the Rhubarb should be allowed to grow and mature its leaves; for, although a very hardy plant, it becomes much weakened if all the produce be gathered. As Rhubarb commences to grow early in the spring, the sooner the ground is prepared and the plants put in the better, when the weather is favourable. Small single crowns will do; but the larger the roots are, the sooner they will produce a heavy crop. From the latter some may be gathered the first year; but the first leaves produced should be allowed to remain.

Edgings for Walks.—Nothing adds more to the tidy appearance of a kitchen garden than good edgings to the walks. Box looks the best, the only objection to it being that it always has a tendency to harbour slugs, especially if the soil is of a strong retentive nature; in such these pests always exist in greater numbers than in land of a lighter and more sandy character. Thrift, or Sea Pink, makes a very nice edging. It is pretty when in flower; but it is open to the same objection as Box, and it also is liable to go off in some places, and become patchy. It spreads fast, and requires yearly regulation. Double Daisies are often used in small gardens, and, from the lengthened time of their flowering, have a cheerful appearance. They do not harbour slugs to any extent; but, on the other hand, from their low growth, they do not much assist in keeping the soil from washing on to the walks, and, consequently, are not suitable where gravel is used, but do better if the walks are made of sea-sand. If the two latter kinds of edging be used, any planting or regulating they require should be done when the weather is mild. Box should not be planted until later.

Peas.—Where Peas sown in the autumn, and above ground before the last severe frost, have escaped destruction, they will be much benefited by a couple of inches of dry sandy soil, such as old potting material, being put to them; this should be done by hand, so as not to break or injure their stems; a sprinkling of fine ashes on the surface will also be of use, by making it less favourable for the movements of slugs, which, with the advent of mild weather, soon begin to be troublesome. Place a few small sticks to the Peas, and run several strands of white cotton round them, to deter the sparrows whose depredations have always the worst effects when growth, as at the present time, is languid. A few Spruce, or other branches of a similar nature, may be stuck in the ground at a short distance from them; they will break the force of cutting winds, but must by no means be placed so near as to cause the Peas to draw up weakly.

Winter Spinach.—This most useful vegetable, of which a good breadth should always be sown, will, if it has been well managed,

now afford a supply. If the plants are at all close in the row it is better, in gathering, at the present season, to pick every other plant out, removing the root altogether. By this means there is more room for those remaining to grow.

Broad Beans.—A piece of ground should at once be dug and prepared for these; but it is not necessary to manure it unless poor. Broad Beans will do well after Lettuce, Cauliflower, or any crop that has required manure; they like strong heavy soil. If it is naturally very light tread the ground a little before sowing. The most economical method as to space is to plant in double rows—that is, two rows a foot apart, and an intervening space of 2 feet betwixt these and the next double row. The Beans should stand 6 or 8 inches apart in the rows, according to the nature of the land; where it is strong and rich they will require more room. Cover the seed about 3 inches deep, after sowing. If the garden is infested with mice keep a good lookout or they will destroy the crop. Where mice exist in a garden, traps should be continually set, but nothing equals a good cat that has been encouraged to frequent the garden by being fed and kept in the fruit or plant houses; if these animals are taught, from the first, to live amongst pot-plants, they move amongst them without doing harm, and are most useful.

New Ground-work.—Where new ground-work is going on, or alterations are being made, they should be pushed on as quickly as possible, for not only are such more likely to turn out satisfactorily when completed before the season gets far advanced, but, if in progress late in the winter, the general routine of spring work gets behind. New turf should (where defective in verges, under trees, or similar places) be laid at once, for, if delayed until dry weather sets in, it has a very poor appearance through the summer.

Glass Structures.—If Peaches and Nectarines are grown under glass, they should at once be pruned and tied, or their flower-buds will get so prominent as to be easily rubbed off in pruning. Do not leave too much wood because it is strong and vigorous. Such requires more room than that which is weaker, and it only leads to overcrowding, which is not the way to get good fruit, or prepare the trees for another season. They may with advantage, when tied into their allotted places, receive a coat of thin paint, made of clay and water, with a handful of flowers of sulphur added to each gallon. Use the mixture in a thin state, and very carefully, if the bloom is at all prominent. I should not advise amateurs to use Gishurst Compound for Peach trees, for, unless it be applied rather weak and early in the season whilst the flower-buds are quite small, it sometimes has the effect of causing them to fall off; the sulphur recommended for mixing with the clay paint will effect the destruction of any eggs of red spider that may exist upon the trees. See that the soil in which the roots are placed, all through the interior of the house, is in a moist healthy condition; it is a good plan to examine the border beneath, for, if any pot-plants have stood in the house, the water which has run from them may give the soil an appearance of being sufficiently wet, when it is only so on the surface. The roots of Peaches and Nectarines should never be allowed to approach a dry state; it is contrary to the nature of the plants, the buds and roots of which are never quite at rest; it is through inattention to this point that the buds frequently fall off after water has been given. Although Camellias are plants of easy growth, provided a few indispensable matters in their cultivation are attended to, they are often met with in amateur's gardens in poor condition. Less than most others can they bear being left dry at the roots. If this happens, especially whilst they are making growth, they are sure to become stunted, and the roots correspondingly weakened. On the other hand, the character the Camellia gets for liking water leads to too much being given, and this is especially injurious if the plants have made little growth, and are weak and deficient at the roots. These extremes must be avoided, for either will cause the buds to fall before opening. The same effects are also produced by too dry a state of the atmosphere, and the use of fire-heat without enough moisture in the air to correct its influence. Tie out Pelargoniums as they advance in growth, and keep them near the glass. Do not over-water them. If the soil is slightly moist it is enough, as they cannot bear to be wet at the root until later in the season, when they are making more growth. Give Cinerarias that are pushing up their flower-stems a little clear liquid manure-water once a week; Primulas flowering will also be benefited by the liquid every alternate time they require watering. Calceolarias will now be growing fast, and will be benefited by manure-water. Winter-flowering Epacris will be fast opening their flowers, and should be placed at the warmest end of the greenhouse, away from draughts. Get sufficient potting soil of the different kinds, such as peat, loam, and leaf mould, under cover, so that it may dry sufficiently for use when the time for potting most stove plants has arrived.

THE CREEPING CORNISH MONEYWORT.

(SIBTHORPIA EUROPEA VAR. ALBO-MARGINATA.)

WHY Nature has been so beneficent as to give to some plants a constitutional elasticity or power of adaptation to the most varied conditions and circumstances, and as rigidly withholds such power from others, we cannot explain; but that such is the fact no better example could be found than in the plant whose graceful adaptability for the decoration of a suspended basket is admirably represented in the annexed illustration. Our little creeping Moneywort, as it hugs the ground or gracefully hangs over a rocky ledge in its native habitat in the south west of England, or the south of Ireland, would scarcely be expected to be at home in the high temperature of our tropical Orchid-houses; yet this it really is. The majority of our hardy plants, when grown under such stimulating conditions, both as regards heat and moisture, soon exhaust their vital energies, and a short life is succeeded by premature decay. It is now a good many years since I saw a basket, whose chief occupant was a Stanhopea, beautifully draped with Sibthorpia, the introduction of which was purely accidental. Though it had been growing under these artificial conditions for more than a year, it appeared to revel in the spongy peat in which it had been introduced, and showed unwonted vigour. If then the ordinary wild form of this Moneywort is endowed with such attractions, how greatly must such endowments be enhanced, when each of its little orbicular leaves is margined with a line of silvery whiteness, a fact to which the accompanying illustration bears ample corroborative testimony. Another important qualification which it possesses, consists in the constancy of its variegation. Such freaks of Nature are often sadly prone to revert to the normal condition, especially when any increased vigour of growth is infused into them. Such is not the case in this instance, however, for among the many hundreds of plants of this Sibthorpia, in Messrs. Lawsons' nursery, not one indicates a tendency of this sort. It is, therefore, doubtless destined to become a most popular plant for many purposes. It would make a lovely edging for a greenhouse or stove shelf, where, with a little damp sand to root in, it would constitute one of the handsomest of fringes; or, for a window-basket, associated with the blue Lobelia or any pink flower, such as Saponarias; or, it might be used as a surfacing for those glasses that constitute the dinner-table parterres recently so popular. To these I might add many other possible adaptations; but when it comes into general cultivation they will suggest themselves. Beyond the fact that the flowers are so minute as scarcely to be observable, any description is rendered unnecessary, the illustration being sufficient to speak for itself. Besides being a free grower, the Sibthorpia may be readily propagated by division; and, in fact, with a little care and attention, every fragment will grow; any ordinary soil of a light character will suit it. When growing freely it is very impatient of dryness; this fact must be especially borne in mind, as suspended baskets are liable to be overlooked in the ordinary watering operations, and a single days' drought will completely mar its beauty for months to come.

JAS. C. NIVEN.

Botanic Gardens, Hull.

Cypripedium japonicum.—This is one of the finest of all the hardy Cypripediums, suitable for pit, greenhouse, and out-door culture. A very rare plant of unique habit, hitherto not found in English collections, from 9 to 12 inches in height, represented by Thunberg with a slender simple flower-scape or stem, having on the upper part a pair of nearly opposite broad, roundish, heart-shaped, sinuately-margined leaves, and a terminal solitary flower, the large front lip of which resembles the outline of a drooping Gloxinia flower cleft on the front, each side division converging. Ground colour of flower white, apparently richly and uniformly stained over with deep claret-red or crimson. The upper erect sepals are green, densely marked with vinous red dots on the lower parallel margins, oblong-lanceolate in form, 1 inch or more in length, and divaricate or spreading. More recent figures indicate some difference in the leaf structure, and favour the opinion that there may be varieties in this species. Dr. Wallace's Japanese correspondent writes, "I came across a Bamboo wood which was full of this Orchid; I find it grows best in moist Bamboo groves in leaf mould; the roots are deep, and find their way into yellow loam."

THE FLOWER GARDEN.

PROPAGATION OF BEDDING PLANTS.

SPRING propagation is a matter which demands considerable attention from those requiring many plants of this kind but who only have limited winter accommodation for them; for a few hundred plants of many kinds may be stored throughout the winter in a very small space, and be multiplied into thousands in the spring. Spring propagated plants of many sorts are preferred for summer bedding to autumn-struck ones. Geraniums are generally propagated in autumn, when large quantities of cuttings can be easily obtained from outside plants. Spring cuttings do not grow large enough for bedding out in May unless rooted very early. A few store-pots of Verbenas, rooted in autumn, are sufficient to give thousands of cuttings from February to March. Spring plants of these are superior to those of autumn. Except in cases of necessity, parent plants are generally cast away when sufficient stock has been obtained. Half-a-dozen old plants of Lobelia, if lifted and potted in autumn, are useful in spring, when every small shoot may be made into a cutting and plant. The surest and quickest way of propagating Lobelias is to have some water-tight pans filled with sand to within an inch of the rim. Put the cuttings in closely, and, when full, give sufficient water, through a fine rose, to fill the pan to the top, so that the whole may be swamped, leaving only the points above water. It will be found that every cutting will root in four days. They should then be planted in some light open mixture, with a temperature equal to that in which they were rooted, which should be 80°. I have rooted them in shallow pans in the same manner. Tropæolums may be increased from every joint of the old plant. Large plants of Heliotrope should always be grown in the greenhouse during the winter to supply sweet-scented flowers; these throw out plenty of shoots for propagation, and, planted out against a wall, give stock successively for years. Plants of the different kinds of Iresines, when kept clear of green fly, are very useful and ornamental in winter decoration; each top and joint may be made into a cutting, and rooted in spring. That useful plant, *Verbena venosa*, may be cut over to the ground level in autumn, and a light covering of manure put over the roots and left there until March, when it should be lifted, the roots laid in a shallow box, loosely covered with earth, and placed in a temperature of 70°. In a few days abundance of young suckers are ready for taking off, not only as cuttings, but many of them as rooted plants.

Old plants of Petunias are the safest to deal with in winter, and increase is certain from them in spring. Dahlias are easily propagated by means of young shoots which spring from the roots when they are planted amongst droppings or any other loose material on the surface of an inside early Peach or Vine border. The growths should be taken off when they are 2 inches long, and, when severed, they should be put singly into small pots, and remain there until plenty of roots are formed. Coleuses are very subject to damp unless large hard-wooded plants are selected for keeping through the winter. These, although sterile-looking during that season, are quite the opposite when treated with a view to obtaining cuttings in spring. Old plants of Fuchsias, when their leaves are cast, may be set underneath the greenhouse stage, and kept there until the beginning of March, when retention in an advanced Vinery produces many suitable cuttings, which should be dealt with in the propagating pit. Salvias, *Amarantus*, *Ageratums*, and similar plants, may be treated as the Coleus; *Centaureas*, *Cineraria acanthifolia*, *C. maritima*, and *Calceolarias* should be rooted in autumn. Propagate *Alternantheras* in August, so that the plants may be as large as possible by planting-out time. In many places they do not grow freely, so that young spring-rooted plants are too tender and small to begin with. Little wintering room is required for them, however, for twenty cuttings may be stored in a 5-inch pot. In many parts *Gazanias* stand out all winter, with no care. Their propagation may, therefore, be deferred until the end of March, when a large batch of cuttings may be obtained and rooted with very little trouble. The old plants will often

split up and form many small plants with roots attached to them. This plant is no favourite of mine; in dull weather the flowers will not open for weeks, and there is nothing else attractive about it. If old stumps of *Wigandias* have been preserved, they supply plenty of cuttings, which make much better plants than any that will grow from seed. The same remarks apply to *Solanums*, *Abutilon Thompsoni*, and others of its kind. Sweet Alyssum is somewhat long in rooting, but it grows freely when this has taken place; I have often seen bits of it planted out with no roots, and succeed well enough. The soil, in such cases, must be light and sandy. Succulents, of the *Echeveria* type, are too small for bedding out the first year after rooting in the spring. The side shoots of *E. secunda glauca* should be divided in autumn, kept in a moderately warm place throughout the winter, and may be planted in May. Rosette *Sempervivums* require the same treatment, but the hardy sorts must be kept in a cool place. The procumbent kinds of *Sedums* and *Saxifrages* may be divided into tufts in April, and planted out at once into the positions they are to occupy during the summer. *Cerastium tomentosum* should be attended to at the same time in like manner. Some of these plants may be raised from seed, but if a good strain of such as *Lobelia* is obtained, the surest way of retaining it pure is to propagate from cuttings. Pansies and *Violas* should be propagated in October, but old plants do well when divided and planted out about the middle of April; *Mesembryanthemum cordifolium* and other useful members of this family succeed well from spring cuttings, and many other kinds of bedding plants of the annual section are raised from seed.

The cultural treatment as to soil and temperature is much the same as that required by cuttings. When seeds are old or hard they should be soaked in water for a few hours to restore their vitality and freshness before sowing. All plants should be placed in a temperature of from 60° to 70°, and be allowed to make a growth sufficient to form a cutting before propagation is attempted, as the soft young wood roots much more freely than old and hard material. When the first leading cutting is taken off, a double quantity is produced the second time, as two shoots push out from the part stopped. A large cutting is always a ready beginning for a large plant, and this method may be practised where great numbers of plants are not required quickly; but, where the most has to be made of everything, the very smallest shoots may be used, for, if treated kindly, they soon grow out of their miniature state. With most soft-wooded cuttings, it is immaterial whether their bases are cut over directly underneath a joint or not. All cuttings should be put in immediately they are severed from the parent plant. To let them flag is a certain loss of substance which they can ill afford at this time; 5-inch pots are the most convenient for propagation, when larger are used the soil in the centre does not derive so much benefit from the bottom-heat as that in the small size. Where space will allow, the larger-sized cuttings root more readily in small thumb-pots than in any other. Little drainage is needed in cutting-pots, as their occupants are not long in them; they should always be filled with a mixture of which at least half is sand and half some open material. As the pots are filled with cuttings they should have a thorough soaking with water at a temperature of 80°, and be immediately plunged in a bottom-heat of 90°. Where the convenience of a well-heated propagating-house cannot be had, a hotbed with a close-fitting frame and glass sashes placed on the top of it is a very suitable substitute. The bottom-heat should be up to 90° before a single pot is plunged in it; one good bed will retain sufficient heat for two months; in cold or wet weather the whole should be well covered up with mats; a little air should be admitted at the top on fine days when the atmospheric heat exceeds the figure given for the bottom-heat. Boxes, 30 by 18 inches, are the handiest receptacles for nearly all kinds of young newly-rooted plants except Geraniums. These should be well-drained with crocks, the roughest parts of the soil being kept at the bottom. Exhausted Mushroom-bed manure should be freely mixed with the good loam into which newly-rooted plants are to be pricked. This matter is nourishing and sufficiently open for the tender roots to make their way freely; when shifted from their propagating pots they should be placed, but not plunged, in a temperature nearly equal to that

to which they have been accustomed. If bright sunshine prevails at that time they must be shaded. The first and second struck batches are generally benefited by having the tops pinched out; these make excellent cuttings. Each quantity must be "hardened off" to make room for successional, and each and all should be encouraged to make a free and hardy growth before being finally planted out.

J. MUIR.

WOODLAND PLANTS IN VERMONT.

THE following are extracts taken verbatim from a letter received from a correspondent in the State of Vermont, U.S.A. They appear to me so interesting and valuable to cultivators in this country that I hope you will find space for them in your columns. I have received from this gentleman the greater part of the plants named in splendid condition, and expect to see them flower this year, though I am afraid that many of them will not last more than a year or two under the most careful cultivation in this country. I have no doubt, however, that many of them might be naturalised in the woods of the Highlands, and should be glad to send some to any lover of such plants whose estate may furnish the requisite conditions. The beauty of many of them must be seen to be appreciated, though it is beauty that is too little appreciated by gardeners generally.—J. H. ELWES.

By the term "rich woods" we usually mean woodlands occupying strong soil, naturally well drained by being situated on slopes or steeper hillsides. The first growth is largely composed of *Fagus ferruginea*, *Acer saccharinum*, *Tilia americana*, *Juglans cinerea*, &c., whose growth is so dense as to forbid the access of Grasses, and the decay of whose abundant foliage falling each year furnishes a rich bed of black mould. In the conditions thus provided—a cool moist soil, very rich in humus, the fierce heats of our summer sun excluded—a large number of plants flourish, such as *Hepatica acutiloba* (*H. triloba* chooses drier sunnier woods), *Actæa alba*, *Sanguinaria*, *Dicentra*, *Claytonias*, *Arisema triphyllum*, *Asarum*, *Trillium grandiflorum*, *Smilacina racemosa*, *Erythronium americanum*, *Uvularia grandiflora*, &c. Where such woods slope to the north, or where the soil is a little more moist, *Orchis spectabilis*, *Aplectrum hyemale*, *Mitella diphylla*, *Tiarella cordifolia*, *Allium tricoccum*, *Medeola virginica*, *Pyrola secunda* and *elliptica*, *Trillium erectum*, and occasionally *Cypripedium pubescens* thrive. Where the soil of our hills is of a sandy nature, and supports a first growth of *Quercus alba* with a mixture of *Pinus rigida* (sometimes *P. strobus*), and often of *Populus tremuloides*, it is much drier and warmer. Through the sparser growth of trees the sunlight gains greater access, a thinner annual coat of leaves returns to the soil, a little Grass gains a foothold. In such situations we shall hardly look in vain for *Hepatica triloba*, *Polygala pauciflora*, *Gaultheria procumbens*, *Chimaphila umbellata*, *Pyrola rotundifolia*, *P. chlorantha*, *Epigæa repens*, *Habenaria Hookeri*, *Spiranthes gracilis*, *Lilium philadelphicum* and *Coralorhiza multiflora*; and, if the soil is thin, being underlaid with broken rock other than limestone, *Cypripedium acaule* may appear abundant. Still less soil and still more of rock will give us *Aquilegia canadensis*. Cold Hemlock woods, gentle slopes covered with a dense growth of *Abies canadensis*, in the deep shade of which few things besides Mosses can grow, will give us *Habenaria orbiculata*, *Mitchella repens*, *Goodyera repens*, and *pubescens*, *Pyrola elliptica*, often *P. secunda*, *Linnæa borealis*, sometimes *Clintonia borealis*, &c. Rich woods pass into swamps, wet peaty low woodlands. Their sylva is composed of *Ulmus americana*, *Fraxinus sambucifolia*, &c. In these, if not too wet, we find *Trillium cernuum*, *Arisema triphyllum*; in the drier portions, *Trillium grandiflorum*, *Habenaria psycodes*, extending into open low Grass lands; sometimes *Cypripedium spectabile*, *Calla palustris*. When the lowlands are covered with *Abies nigra* and *alba*, *A. balsamea*, *Larix americana*, and *Thuja occidentalis*, they are usually called "Cedar swamps," and are more or less carpeted with *Sphagnum* and other Moss. Here *Clintonia borealis* is the commonest plant. *Trientalis americana*, *Habenaria tridentata*, *Streptopus roseus* and *amplexifolius*, *Smilacina triflora* and *stellata*, *Habenaria dilatata*, *Cypripedium pubescens*, *parviflorum*, *spectabile*, and *aretinum*, *Pyrola rotundifolia* var. *uliginosa*, *Chiogenes hispidula*, *Epigæa repens*, *Linnæa borealis*, are common, and in somewhat open places *Cassandra calyculata*, *Kalmia angustifolia*, *Rhodora canadensis*, &c. These Cedar swamps often run into or border cold *Sphagnum* bogs, the margins of ponds, or old ponds long since filled up by the growth of *Sphagnum*, &c. Very likely a few stunted Spruces (*Abies nigra* or *alba*) are the only trees that have ventured in this unstable soil. Among them and skirting them are *Kalmias*, *Cassandra*, *Myrica Gale*, &c.; but rooting in the decaying *Sphagnum* the following plants find a congenial home:—*Pogonia ophioglossoides*, *Colopogon pulchellus*, *Arethusa bulbosa*, *Habenaria dilatata*, *Microstylis ophioglossoides*, *Listera cordata*, *Sarracenia purpurea*, &c. Thus I

have glanced at nearly every variety of soil and situation in this region. I will now speak of a few plants in particular—*Trillium erythrocarpum* grows abundantly in rich woods of our cooler mountain sides, with it also grows in perfection *T. erectum*; *Lobelia cardinalis*; *Asclepias incarnata*, *Iris versicolor*, *Spiranthes cernua*, and *Habenaria dilatata* prefer open moist Grass lands and do best (the first three certainly) by the side of brooks. None of the *Cypripediums* I think, not even *spectabile* and *aretinum* place their roots where they will be overflowed with water at any time during the year. It may be only a little knoll or a rotting stump, or prostrate log that serves to raise them above the level of high water. That the roots are often frozen I cannot doubt, but probably they are seldom intensely frozen, owing to the protection afforded by the Moss and leaves that cover them. The soil of our Vermont woods freezes very little; it is protected first by the covering of leaves, then by a coat of snow, which, in the shade of the trees, leafless though they are, seldom melts during our winter thaws. The roots of *Orchis spectabilis* often have a good deal of water during the entire year; for example, near swamps through which some rill soaks down through the peaty soil is a favourite situation for this plant; but the crown of the plant is always, I think, raised a few inches above the water level. With respect to *Sarracenia*s I have to tell you that *purpurea* is very abundant here. It grows in bogs rooting in *Sphagnum* or morasses, and, with the contents of its pitchers, is hard frozen during winter. Often it must be imbedded in solid ice, and is thawed and frozen several times during winter; yet, it is so hardy that all this severe treatment injures it not the least. *Sarracenia flava*, a native of the Southern States, must be able to endure several degrees of frost.

SWEET-SCENTED FLOWERS.

THIRTY years ago I published a small volume on the sweet-scented flowers and shrubs cultivated in the gardens of Great Britain. The volume has long been out of print; but, as recent investigations have given a new interest to the subject, it seemed worth while to make a classified list of the species mentioned in that forgotten work which were there partly arranged in an alphabetical manner. It will be observed that the catalogue is limited in several ways. It does not include stove or greenhouse plants, nor wild plants which are never cultivated, nor agricultural plants, nor pot-herbs. A few species are included in it whose scent resides in the leaves and not in the flowers because it was intended for the help of amateur gardeners. Opinions may differ as to the sweetness of some of the odours, but I give the list entire, with the nomenclature of that period. It was, no doubt, imperfect even at that time, and probably many more species might now be added by anyone familiar with the gardens of the present day. There can scarcely be less than 5,000 species, hardy and half-hardy, cultivated in English gardens, and 217, which is the number in this list, seems to be but a small proportion of fragrant ones. The following observations suggest themselves in looking through the list:—That scent is associated with flowers of all colours; that, nevertheless, the order *Campanulaceæ* and the genus *Gentiana* are unrepresented, and that the flowers of these groups are chiefly blue; that scarcely any order can claim fragrance as a universal character; that in many genera one species only will be fragrant, while all the rest are scentless; that by cultivation and hybridisation fragrant varieties may be developed from scentless stocks.

Dicotyledons.

RANUNCULACEÆ.	Hesperis	BITTNERIACEÆ.	Cytisus
<i>Clematis</i>	<i>matronalis</i>	<i>Hermannia</i>	<i>scoparius</i>
<i>Flammula</i>	<i>Mathiola</i>	<i>fragrans</i>	<i>juncus</i>
<i>florida</i>	<i>annua</i>	<i>odorata</i>	<i>J. var. odoratis-</i>
<i>Sieboldii</i>	<i>incana</i>	TILIACEÆ.	<i>simus</i>
<i>Pæonia</i>	<i>tristis</i>	<i>Tilia</i>	<i>Laburnum</i>
<i>edulis</i>	<i>odoratissima</i>	<i>europæa</i>	<i>L. var. odoratus</i>
<i>Platystemon</i>	<i>Koniga</i>	VITACEÆ.	<i>Genista</i>
<i>californicus</i>	<i>maritima</i>	<i>Vitis</i>	<i>canariensis</i>
BERBERIDACEÆ.	<i>Iberis</i>	<i>riparia</i>	<i>Robinia</i>
<i>Berberis</i>	<i>odorata</i>	LIMNANTHACEÆ.	<i>hispidula</i>
<i>vulgaris</i>	<i>Schizopetalon</i>	<i>Limnanthes</i>	<i>Wistaria</i>
<i>Aquifolium</i>	<i>Walkerii</i>	<i>Douglasii</i>	<i>sinensis</i>
<i>dulcis</i>	RESIDACEÆ.	PITTOSPORACEÆ.	<i>Glycine</i>
NYMPHÆACEÆ.	<i>Reseda</i>	<i>Pittosporum</i>	<i>Apios</i>
<i>Nymphaea</i>	<i>odorata</i>	<i>Tobira</i>	<i>Lupinus</i>
<i>odorata</i>	VIOLACEÆ.	RUFACEÆ.	<i>luteus</i>
MAGNOLIACEÆ.	<i>Viola</i>	<i>Dictamnus</i>	<i>Amorpha</i>
<i>Magnolia</i>	<i>odorata</i>	<i>Fraxinella</i>	<i>microphylla</i>
<i>grandiflora</i>	<i>tricolor</i> , cult.	<i>Diosma</i>	<i>Lotus</i>
<i>glaucæ</i>	var.	<i>ericoides</i>	<i>odoratus</i>
<i>conspicua</i>	CARYOPHYLLACEÆ.	RHAMNACEÆ.	<i>Lathyrus</i>
<i>macrophylla</i>	<i>Dianthus</i>	<i>Ceanothus</i>	<i>odoratus</i>
<i>obovata</i>	<i>plumaris</i>	<i>americanus</i>	<i>Coronilla</i>
<i>tomentosa</i>	<i>Caryophyllus</i>	LEGUMINOSÆ.	<i>glaucæ</i>
CRUCIFERÆ.	<i>barbatus</i>	<i>Ulex</i>	<i>argente</i>
<i>Cheiranthus</i>	<i>Lychnis</i>	<i>europæus</i>	<i>Acacia</i>
<i>Cheiri</i>	<i>coronata</i>	<i>nanus</i>	<i>armata</i>

Dicotyledons (continued).—

Acacia	(E)nothera	Erica	SCROPHULARINEÆ.
suaveolens	nocturna	regerminans	Mimulus
ROSACEÆ.	MYRTACEÆ.	Bowieana	moschatus
Cratægus	Myrtus	EPACRIDÆ.	Erinus
Oxyacantha	communis	Epacris	fragrans
odoratissima	PASSIFLOREÆ.	pulchella	Buddlea
Pyracantha	Passiflora	JASMINÆ.	globosa
Pyrus	incarnata	Jasminum	LABIATÆ.
domestica	CAPRIFOLIACEÆ.	odoratissimum	Lavendula
Eriobotrya	Sambucus	revolutum	Spica
japonica	nigra	humile	Thymus
Prunus	Viburnum	officinale	vulgaris
Laurocerasus	odoratissimum	Sambac	Monarda
lusitanica	Caprifolium	Nyctanthus	fistulosa
Rubus	Periclymenum	arbor-tristis	didyma
odoratus	gratum	OLEINEÆ.	purpurea
Rosa	flexuosum	Olea	VERBENACEÆ.
centifolia	RUBIACEÆ.	fragrans	Verbena
indica	Asperula	Syringa	teucrioides
rubiginosa	odorata	fragrans	Aloysia
spinosissima	DIPSACEÆ.	vulgaris	citriodora
damascena	Scabiosa	persica	PRIMULACEÆ.
cinnamomea	atro-purpurea	sinensis	Primula
moschata	compositæ.	ASCLEPIADEÆ.	Auricula, cult.
canina	Artemisia	syriaca	var.
arvensis	Abrotanum	Periploca	veris
Potentilla	Tussilago	græca	vulgaris
fruticosa	fragrans	Hoya	elator
Spiræa	Liatris	carnosa	Cyclamen
Ulmaria	odoratissima	APOCYNÆ.	persicum
frutex (salici- folia)	Centaurea	Gelsemium	NYCTAGINEÆ.
hypericifolia	moschata	sempervirens	Mirabilis
Agrimonia	Cineraria	POLEMONIACEÆ.	longiflora
odorata	several cult. vrs.	Leptosiphon	LAURACEÆ.
eupatoria	Eriocoma	androsaceus	Laurus
CALYCANTHEÆ.	fragrans	densiflorus	nobilis
Calycanthus	Helichrysum	CONVOLVULACEÆ.	PROTEACEÆ.
floridus	fragrans	Ipomœa	Leucospermum
Chimonanthus	Stæbelina	Bona-nox	candicans
fragrans	dubia	Cuscuta	THYMELEÆ.
PHILADELPHÆÆ.	ERICACEÆ.	verrucosa	Daphne
Deutzia	Andromeda	BORAGINEÆ.	odora
scabra	floribunda	Heliotropium	Cneorum
Philadelphus	Rhododendron	peruvianum	Mezereum
coronarius	odoratum	europœum	ARISTOLOCHIEÆ.
GROSSULACEÆ.	Azalea	SOLANÆ.	Asarum
Ribes	viscosa	Petunia	virginicum
aureum præcox	v. var odorata	nyctaginiflora	AMMENTIFERÆ.
ONAGRARIÆ.	Bejaria	Datura	Salix
(E)nothera	racemosa	ceratocaulon	pentandra
odorata	Erica	Nicotiana	triandra
tetraptera	suaveolens	noctiflora	amygdalina
triloba	odorata	persica	
	fragrans	undutata	

Monocotyledons.

ORCHIDACEÆ.	Gladulus	Watsonia	Lilium
Platanthera	concolor	marginata	candidum
bifolia	viperatus	AMARYLLIDÆÆ.	Muscari
Gymnadenia	alatus	Narcissus	moschatum
conopsea	trichonemifolius	papyraceus	Hyacinthus
IRIDÆÆ.	Hesperantha	Jonquilla	non-scriptus
Crocus	cinnamomea	Tazetta	orientalis
suaveolens	falcata	Poeticus	Convallaria
versicolor	radiata	Galanthus	majalis
Iris	angusta	nivalis	Anthericum
persica	graminifolia	Leucojum	fragrans
Babiana	pilosa	vernum	Bulbine
plicata	Ixia	æstivum	alooides
disticha	columellaris	Sternbergia	pugioniformis
sambucina	odorata	colchicifolia	frutescens
angustifolia	retusa	Chlidanthus	Lachenalia
Gladulus	flexuosa	fragrans	fragrans
suavolens	Tritonia	LILIACEÆ.	AROIDÆÆ.
versicolor	odorata	Hemerocallis	Calla
recurvus	squalida	flava	æthiopica

[The preceding list, furnished by a correspondent of the "Gardeners' Chronicle," is very imperfect. Hundreds of hardy plants alone might be added to it. With reference to the remarks on the Gentian family, we have certainly found *G. verna* frequently with a distinctly agreeable odour.]

Layering Clematis Jackmanni.—A few days ago I was lifting layers of *Clematis Jackmanni* which were buried about 5 inches deep a year ago. They had all rooted well, and, if potted now, will make fine plants for this year's flowering. Examine the roots very carefully, and if you can manage to cut off an eye with the least bit of root attached to it, put it into heat, and by next autumn you will have a capital plant for outdoor planting. The plants which I thus obtained last spring are almost as fine now as their parents. All the *Jackmanni* section will easily multiply in this way, and I cannot understand why this system is not more used than it is by nurserymen. Could any plant yield such a return as this? You can buy good plants at one shilling apiece, layer them, and make, in a year's time, two or three good plants from each, besides having your original plant in hand, and any others you may obtain from rootlets. Two plants (two-year-olds) have produced together twelve fine plants, and all the result of half-an-hour's labour. At Sir John Majoribanks, at Coldstream, I have seen flowers of *Clematis Jackmanni* on a north wall, in a wet peaty soil, more than 6 inches across, and much deeper in colour than if exposed to the full rays of the sun. It is generally finer on a north wall than in any other situation, provided it has a moist vegetable soil to root into, and plenty of it. Deeper and richer in colour is *Clematis velutina purpurea*, one of Messrs. Jackman's latest seedlings.—FRANK MILLS.

THE FRUIT GARDEN.

VINES AT DRUMLANRIG.

I HAVE sent you a piece of wood of the Bowood Muscat, cut from the top of a 22-foot rod at Drumlanrig, last November.* It is, as you will see, as firm and hard as a piece of ebony. Not only this variety, but the whole of the young Vines there are in unusually good condition, not one small or imperfect cane being amongst them. The house in which the Muscat grows is a very commodious one; its rafters are 22 feet in length, and it is kept at a temperature suitable for Black Hamburgs. It contains, besides the Muscat, Hamburgs of different kinds, Buckland Sweetwater, Foster's Seedling, Black Alicante, Duchess of Buccleuch, and Mrs. Pince, none of which are inferior to the sample sent. These were all propagated from eyes, and planted out at midsummer, 1873. The growth which they made from that time until the end of the season was most satisfactory. They were cut back to within 2 feet of the bottom in the spring of 1874, and their progress since that time has been all that could be desired. In November last, numbers of supernumerary rods of Gros Colman were in fruit in this house. These, to give the bottom growth of the permanent canes full justice, had been disbudded to within 7 or 8 feet of the top, and when I saw them they were bearing bunches that would average about 3 lbs. each, and I counted nine of such bunches on the 7 feet of cropped space. A house next to the one just described is planted with Muscats, Trebbiano, Raisin de Calabria, Syrian, Gros Guillaume, and Gros Colman. Duke of Buccleuch had fruited excellently as a supernumerary in this house, and permanent Vines of it formed no exception to the others. I had the curiosity to measure the girth of a rod of Trebbiano, and found it to be 4½ inches at a foot above the ground. About a foot further up it branched into three leaders, 22 feet each in length. This Vine was struck from an eye and planted, like the others, in 1873. The fruit of Syrian, Trebbiano, and Raisin de Calabria, was excellent, not only in flavour, but in size of bunch and berry. They were, in short, model bunches, compared with those one often sees after the "damping" to which Grapes are subjected in October and November. It is not, I know, unusual for a Vine to make 22 feet of young wood in a season, but it is an uncommon occurrence for such growth to be equal in thickness at top and bottom in a length of 22 feet, and this was the case with the Vines in question. This growth, too, was thoroughly ripened, a difficult matter with many. Every rod, lateral growth, and leaf-stem was ripe nut-brown and the foliage was still green; this has been effected by care and attention alone, as Dumfriesshire is one of the wettest counties in Scotland, and sunshine, which is generally considered indispensable, has had but little to do with the result. These Vines replaced those which were destroyed by the *Phylloxera*. The borders in which they grow have been carefully made, but the soil is not different from that in which Vines are usually grown. M.

PEAR SYNONYMS.

IN reply to your correspondent, "B. S.," allow me to mention that the Soldat Laboureur is a variety which was obtained by Major Espéren, a well-known Belgian raiser. The name Soldat D'Espéren, which has also been given to this variety, must be considered as an abbreviation of Soldat Laboureur Espéren. Orpheline D'Enghien, Beurré Deschamps, Beurré d'Arenberg (in Belgium) are synonyms. It is possible, however, that a slight dissimilarity may exist between the Beurré d'Arenberg (in Belgium) and the Beurré Deschamps and Orpheline d'Enghien, but it is not sufficient to constitute different varieties. This, at least, was the opinion of the French Pomological Congress. Glou Morceau, Beurré d'Arenberg (in France), and Beurré d'Hardenpont are only one and the same variety. The last name is that which has prevailed with the French Pomological Congress, and it is necessary to remark that, by the adoption of this title and of that of Orpheline d'Enghien, the various kinds of Beurré d'Arenberg have been made to disappear, and henceforth any further confusion between two very distinct varieties, which had previously but a single name, is rendered impossible. Colmar d'Hiver is an entirely different fruit from the preceding—a fact which has already been pointed out in THE GARDEN. I am happy to have been so well understood by "B. S.," who has perfectly recognised the circumstance that the seven names quoted by him in reality apply to four varieties. As regards the Beurré Spence, it is far from being the same as Urbaniste, but it is a synonym of Flemish Beauty (Belle de Flandre in French), and also of the Beurré Davy, the Beurré de Bourgogne, &c. Our Jargonelle, in fact, differs from the Pear which bears that name on the other side of the district, and which is here called Epargne Cueillette, and perhaps more frequently Cuisse Madame. I am also at a loss to understand why in England you give the name of

Royal Muscadine to our favourite Chasselas de Fontainebleau, a variety which, by-the-bye, originally came from Cahars in Languedoc. I must confess that, in publishing "The Fruit to Cultivate," I had in view the kinds best adapted to the climate of Belgium and France; but I also believe, with my friend Mr. W. Ingram, that at least the majority of the varieties of Pears that I have recommended would be valuable for cultivation in England. If the Beurré Superfin and the Beurré Hardy are fruits which at Belvoir ripen too quickly, I can only say that here I have never observed that fact. Beurré d'Anjou is a name that ought to be got rid of. The fruit to which it is applied is the Ne Plus Meuris, or, more correctly, the Ne Plus Ultra Meuris, an excellent Pear obtained by Van Mons, and named after his gardener Meuris. I know that Mr. Rivers at one time cultivated under the name of Ne Plus Meuris a different Pear—a smaller fruit, and one that ripened later. Passe Colmar is, without doubt, an excellent Pear, but it is one which does not seem to thrive in some parts of England. I have felt much satisfaction at seeing the Olivier de Serres praised; it is unquestionably a fruit that will prove good in all respects, and is destined to be grown on a large scale. I have not had the opportunity of knowing the Victoria and Prince Consort Pears of Mr. Huyshe. Knight's Monarch does not do so well here as in England, added to which the tree is a bad grower, at least when grafted on the Quince. I regret that I am unable to speak in terms of praise of Beurré Rance. Too often the late ripening of this fruit constitutes its only merit. I have rarely eaten any of really superior quality. On an espalier, even, it leaves much to be desired.

F. JAMIN.

COST OF PRODUCING HOME-GROWN POT VINES.

YOUR correspondent, "Mr. Muir," says (p. 45), that pot Vines can be bought both better and cheaper from the trade than they can be grown at home. Allow me to inform him that I have grown pot Vines for many years in considerable quantity—sometimes disposing of a few surplus plants to the trade, for which I can always get the highest price, and the cost of production is about 3s. each at the most, including the price of the pot. I set a small house apart for the purpose, airing it in a systematic way, and I have never been able to buy such Vines, as regards vigour and earliness, as I can grow myself. What I do others no doubt can do as well, and do so frequently to my knowledge. "If growers for the trade" can grow pot Vines for 5s. or 6s. a-piece, according to vigour, and get a profit out of them, one would imagine that the private grower could save a trifle by growing his own. I know one grower who produces about 2,000 pot plants every year for seedsmen, who only sell them, and both apparently thrive on the business. I know one firm which buys about 700 plants annually from this raiser, and sells them for from 7s. 6d. to 10s. 6d. and 12s. each. I will not say that good Vines are not to be had from nurserymen, but I am sufficiently acquainted with the trade to know that your correspondent's statements are an exaggeration in this matter. It is new to me to learn that "skilful Grape growers" generally fail, "year after year, in growing pot Vines." I have had more to do with Vine growing than anything else, for nearly thirty years, and I never knew a "skilful Grape grower" fail to grow pot Vines with ease and little expense, when he found it necessary to do so, and set about it in a practical way.

VITIS.

Mr. Muir, in recommending bought pot Vines, speaks rather disparagingly of the attempts of gardeners in private establishments to grow their own Vines, and I very much question his statement that "skilful Grape-growers fail to grow their own pot Vines successfully." I know many gardeners who would consider buying ready-grown pot Vines little better than buying ready-grown Grapes, and many more in small places who actually have not the means allowed them to buy Vines, and are yet expected to cut Grapes from pot Vines in April and May. As to the "extra care and attention" given to pot Vines in nursery establishments, it is only where a speciality is made of their culture that this happens; and on Mr. Muir's own showing, in spite of the care and attention given them, and the economical way in which they are grown by the trade, a high price is demanded, or else one must put up with a bad article. I do not object to Mr. Muir praising the excellence of trade produce, but I certainly think that he would have rendered more real service to horticulture had he told us exactly how pot Vines are grown by the trade instead of disparaging the well-meaning efforts of those who, by either choice or necessity, grow their own canes. Let us look at the matter in another light. Pot Vines are "readily obtainable" only when one has the money to buy them. Supposing I wanted to buy, say, two dozen fruiting canes. They must be strong, short-jointed, and well ripened, and for these I must pay at least 12s. 6d. and perhaps 15s. each,

equal £14 8s. or £18, as the case may be, to which must be added £3 at least for carriage and packing; this gives £17 8s. or £21, besides the chance of introducing that terrible pest which I happen to know has quite recently ruined some of the best Vines in the country, in spite of the utmost caution to prevent its introduction, and the most strenuous efforts to eradicate it immediately its presence was discovered. I will say nothing of my own Vines, but I am at liberty to speak of the productions of other private gardeners, who grow pot Vines equal to any ever sent out by the trade. Mr. Gilbert, at Burghley, showed me a splendid lot of canes last year, and there are but few growers, with whom I am acquainted, who cut better Grapes from pot Vines than he does, year after year. Another excellent grower, Mr. Mackellar, when at Elvaston Castle, grew his own Vines from eyes, and he has cut clusters of Black Hamburgs from pot Vines, weighing from 1 to 3 pounds each, the whole crop averaging considerably over a pound each bunch; facts which I merely mention to convince Mr. Muir that at least some private growers can grow pot Vines equal to those sent out by the trade.

J. CHURCHILL.

Whalley Range.

GRAPES TRAVELLING WITHOUT PACKING MATERIAL.

AFTER the care and attention required to grow good Grapes, well-coloured, with a good bloom on them, the next consideration, is how shall they be packed in order to preserve the bloom from being rubbed off them. Different gardeners have different ways of packing. Some sixteen or eighteen years ago wrapping each bunch in tissue-paper, and packing them with paper shavings was recommended, a practice which I have seen adopted a few months back. No doubt Grapes packed in this way carry well, but most of the bloom (which is so much admired on the dinner-table) is left in the packing material. In your paper (see p. 30) a correspondent writes to say, that Grapes sent from Clovenfords to London in baskets, without packing material, arrived at Covent Garden in as fine condition as if they had never been packed. This is surely saying too much, because, if Grapes rub against one another, the bloom will, as a matter of course, be damaged more or less; but still, in my opinion, no packing is best. An amateur, however, who wishes to send 8 or 12 pounds to a friend, would find it both expensive and inconvenient in many cases to use baskets. I send a great many Grapes to London and other distant places, and the condition in which they arrive gives perfect satisfaction. First of all, our boxes are all made of $\frac{3}{4}$ inch sawn boards, and for all ordinary-sized bunches (that is, from the smallest to those of 1½ lbs. weight) the boxes are constructed with a depth of 5½ inches. I allow 16 square inches to every pound, except for more than 12 lbs. weight, when I allow only 15 square inches to a pound, for the larger the box the less room they take; for instance, if I receive an order for 6 lbs. of Grapes, I multiply 16 by 6, which will require a box 12 by 8 inches, or if for 12 lbs., a box 15 by 12 inches and 5½ inches deep. For the larger sorts, as Barbarossas, Alicantes, &c., we make the boxes according to size, and pack the Grapes on their sides. I first cover the bottom of the box with a depth of about ½ inch of soft hay, then lay a sheet of strong white cap-paper over it, and a piece round the sides, weigh the box, take it to the Vinery, and place it firmly on one end, at an angle of about 75°. I next lay a bunch in each corner, and a little discretion will be required to cut them of a size that will just fit, and pack the others tight, as a bunch should never be moved after being once in position; a little practice, however, will soon make this easy. Continue in this way till the box is full, when the Grapes should be half an inch from the lid, when closed, and the stalks being 2 or 3 inches longer, act as a spring against the lid when shut, thus obviating oscillation. Ordinary-sized bunches are placed as much as possible on end, as they can be thus packed closer together than in any other way.

JAMES SMITH.

The Gardens, Waterdale, St. Helen's.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Irrigating Vines.—A Californian correspondent states that he irrigates his Vineyard by covering the ground with water when the Muscats are about the size of small Peas. If irrigated earlier the fruit is apt to drop; if later, the soil remains too wet at the time of ripening, and causes mildew. He adds:—On some portions that I did not irrigate I raised 20 lbs. of first crop and 50 lbs. of second crop per Vine. But where I irrigated the yield was much larger—so much so that I determined always to irrigate in the future. I can raise on the larger Vines 50 lbs. average at the two crops. This will make 17 lbs. of raisins, which at present prices will sell for 8s. I set 500 Vines per acre, which gives £200 per acre for Muscat raisins.

Furnishing a South-west Wall with Fruit Trees.—At line eight of the paragraph (see p. 45) having reference to this subject, for "at first independently of the Vines," read "at first independently of the wires."—B. S.

THE KITCHEN GARDEN.

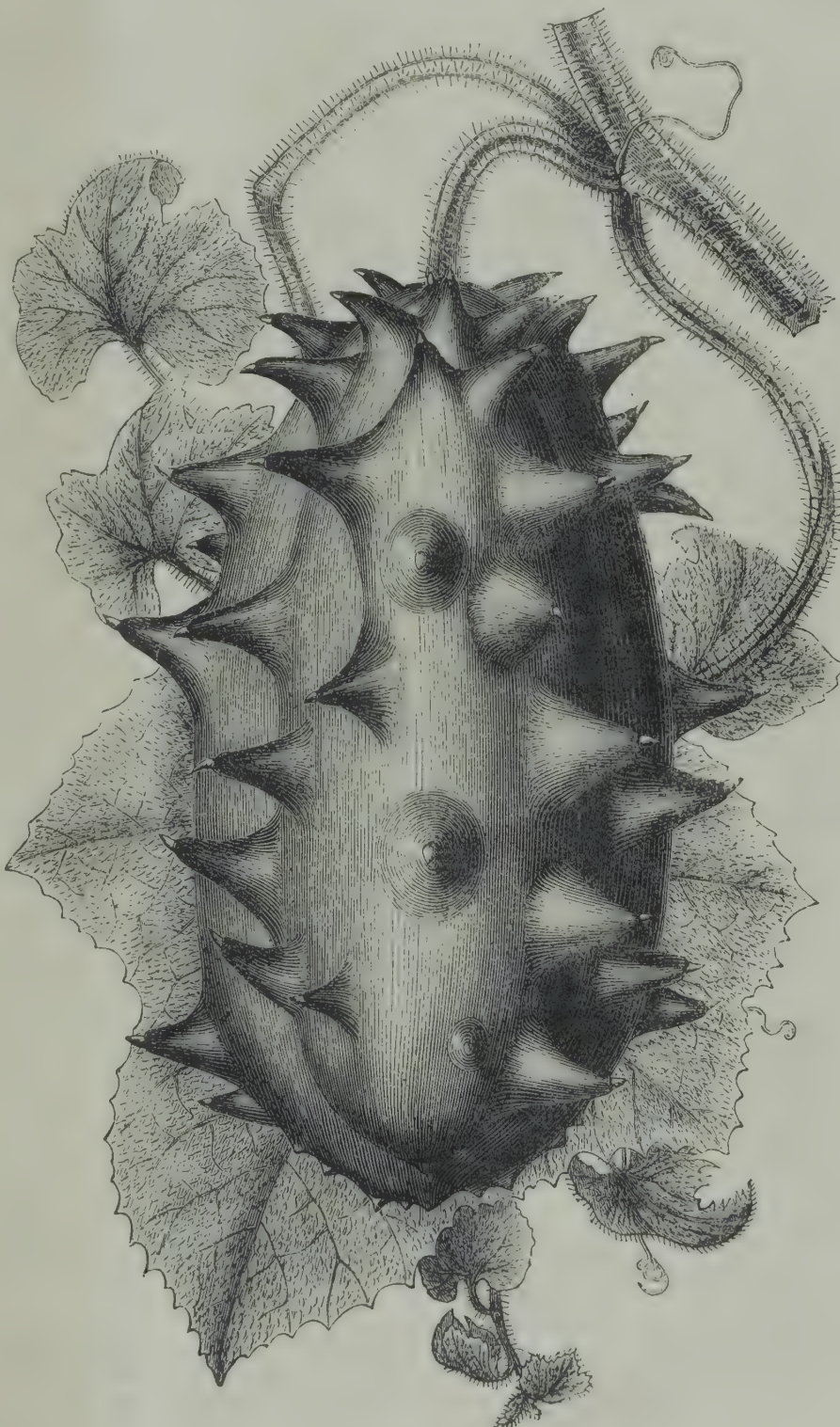
MUSHROOMS AND MUSHROOM-HOUSES.

THE importance of plenty of Mushrooms, where a large establishment has to be supplied with them, can scarcely be over-rated. To the Mushroom-house, therefore, much attention must be devoted; but it sometimes happens that a house built expressly for the growth of Mushrooms is less efficient than some shed or out-building that is occupied in that way merely because nothing better is available. This may be accounted for by the builder, unacquainted with the conditions under which the Mushroom will grow, providing, as he often does, ample light and ventilation, when these should invariably be carefully excluded. If we consider the fact that Mushrooms spring up most abundantly with us in autumn on old pasture land, especially after hot summers, while the earth retains its heat and the nights begin to lengthen and become cool and highly charged with atmospheric moisture, we shall have some guide to their treatment under artificial conditions. Without this kind of atmosphere, however carefully the beds are made and attended to, the results will not be satisfactory, more especially if much fire-heat is needed to keep the temperature up to its proper height. The best of all situations, when available, in which to grow Mushrooms, are underground caves, such as supply the Paris markets with such vast quantities. These contain a still, humid atmosphere, and where a succession of beds is constantly in course of formation, the air becomes charged with ammonia, which greatly assists the growth of the young Mushrooms. When such situations are not available, the best plan for securing the required amount of humidity in the air of the Mushroom-house or shed is to keep a heap of fresh fermenting manure in it, and frequently turn it over. This will be found superior in effect to any evaporating trough or steaming apparatus. A long close-roofed shed here is the best place for the Mushroom-beds I ever met with, although it was not built for that purpose. The reason is that a large tank for heating water for horticultural purposes is fixed at the end of it over a tubular boiler. This gives off so much steam that the shed is useless for storing anything that will either rot or rust. The beds in this shed never require mulching or watering, and continue hearty for an unusual length of time. The method of preparing Mushroom-beds has been so often described in your columns that I need not enter upon it further than to say that we mix a good quantity of fresh loam with the stable manure, which moderates the heat, and consequently makes it more lasting. A temperature in the beds of 80° at spawning

time, and an air-heat of 55°, we find to suit admirably. Another and important point is a good clayey loam with which to earth the beds. This should be beaten down as hard as mallet and spade can make it, and wetted so that a smooth spade will slide over it. It is often stated that any sort of soil will do for covering the beds, and this to a certain extent is true, inasmuch as, if all other circumstances are favourable, some Mushrooms will be produced; but the produce will be neither so good in quality nor so lasting as when a rich loam is employed. One of the many advantages of a firm surface to the beds is that the Mushrooms form on the surface, and are easily gathered without injury to the bed; but with soil of a loose texture the

majority of the Mushrooms will form on the manure, and cannot be gathered without disturbing the growth of many of the successional ones.

J. GROOM.



Cucumis metuliferus.

ORNAMENTAL GOURDS.

IN warmer latitudes, Gourds are common in all gardens. It is different, however, in this and other temperate climates, where creeping plants of rapid growth and large development, cultivated for ornament, are so limited in number, but none of them ought to be rejected if they can, either by their fruit, flowers, or foliage, serve to ornament trellis-work, or cover walls or arbours. For this purpose nearly all Gourds appear well adapted, and deserve to be much more frequently used, and under more varied conditions, than is now generally the case. Our engraving represents one of the most singular of Cucurbits—one having oblong fruits set with stout horn-like protuberances. Its fine lobed foliage is heart-shaped at the base, and of a fresh green colour. The main essentials, as regards culture, are a deep rich soil, a warm sunny position sheltered from high winds, and a plentiful supply of water or liquid manure during hot dry weather.

How to Clean Gravel Walks with Salt.—To maintain garden walks in the best order, and free from weeds, is often a difficult task, especially where the means and assistance at the command of the gardener are inadequate to the extent of ground allotted to his charge. Walks, moreover, to be really smooth and pleasant to walk upon require either to be hand-picked or salted, and never touched by hoe or rake, which only bring the gravel to the sur-

face, and leave the binding materials beneath. The plan we practise here is so simple and effectual, that I will try to explain it. Instead of boiling water for melting the salt and applying it hot, as is done by Mr. Fleming's method, we simply put the salt into cold water, at the rate of $\frac{1}{2}$ lb. to the gallon of water. The water cask we use holds upwards of a hogshhead, and 28 lb. of salt is put into it at one time with 56 gallons of water; while one man fills in the water another is stirring the salt, and by the time the proper quantity is in, the salt has melted, and the salted water is ready to move away to where it is to be applied. The two men, being each provided with a large watering-can having on it a wide-spreading rose, commence watering by facing the centre of the walk,

and, keeping their hands low, they move along the sides for a short distance first, so as not to allow any of the water to be nearer the Box-edging or Grass-verge than about 4 inches. They then turn into the centre of the walk, and apply only sufficient to make it wet all over the surface. This small quantity soon dries up, and leaves the walk with a whitish appearance, which remains until rain falls to wash it down; and then, as soon as it becomes dry, it assumes a bright and clean appearance, and will keep so throughout the season. The great desideratum is, however, to make the application only when the walks are dry, and the weather clear and hot. Any time during the month of April is a suitable period. I prefer coarse salt to fine. What we use is the same as the fish-curers make use of. The cost here is £2 per ton.—J. WEBSTER, in "The Florist."

POTATOES GROWN IN 1874 AT CHISWICK.

By A. F. BARRON.

AFTER the full and comprehensive trial of Potatoes made by the fruit and vegetable committee in 1873, it was not this season deemed necessary to continue the cultivation of so complete a collection. The trial has, therefore, been confined to sorts which were not cultivated last season, or which were but imperfectly represented. Several of the leading types have been grown for comparison. The collection, about 158 in number, was planted on the 23rd of March on well-trenched and manured ground. The sets were in most cases put in whole, in lines, 3 feet apart, and about 20 inches between each set. The plants came up well, and looked promising, but were cut down by frost repeatedly. This caused a great number of stems to perish, and, combined with the exceeding dryness of the summer, tended to make the crop small, although it was of excellent quality. The disease did not make its appearance until the 6th of August, and then the tubers were affected, whilst no trace of it could be found on the haulm. Several varieties suffered severely, especially some of the American sorts, Lapstones and Red-skinned Flour-ball. In 1873 the Regent class suffered most severely, and the Red-skinned Flour-ball was almost free. This season the result is exactly the reverse. Many of the stools had a dressing of Amies' patent chemical manures, which certainly tended to increase the crop. The committee examined the Potatoes, whilst growing, four times, and awarded five first-class certificates. The number of assumed distinct varieties examined amounts to 280, not including some sixty unnamed seedlings. This formidable list has been reduced by the detection of synonyms to 150 varieties, which have been described, and are probably distinct. In the following list the same arrangement is adopted as in the report of last year (see Vol. V., p. 103). This may be referred to for the descriptions of the kinds which were tried then:—

Series I.—Skin White or Straw-coloured.

§ 1. Long or Kidney-shaped.

Ashleaf Kidney.—Synonyms, Marjolin, Oakleaf, Duckstone, Sandringham, Kidney (Minier & Co.), Early White Long Kidney (Veitch), and Cooling's Improved Ashleaf (Cooling).

Mona's Pride.—Haulm and general characters of plant same as in Ashleaf Kidney; tuber, short, rather broad and flat. An excellent variety.

Kentish Ashleaf Kidney.—Synonyms, Veitch's Improved, Cave's Seedling, Cambridgeshire Kidney, Nutbrown, Alma Kidney, Early May, Benson's Seedling, Shepherd's Kidney, Reynard, Nonsuch, Tory, Conqueror, Mona's Pride, Champion, Early Ranelagh, Laing's First Crop, Stillyan's Kidney, Gillman's Early Pebble (Gillman), Welbeck Seedling (Tillery), and Champion (Harrison & Sons).—This, in 1873, was considered distant from Myatt's Ashleaf, on account of the latter being berry-bearing, whilst the Kentish was not so. It has, however, this season produced flowers; so it is doubtful whether any distinctions really exist, further than what may be obtained by change of seed.

Myatt's Ashleaf Kidney.—Synonyms, Rivers's Royal Ashleaf, Sandringham Kidney, Myatt's Prolific, Gloucestershire Kidney, Derbyshire Prize Taker, and Lee's Hammersmith Kidney.

Bonnemain (Carter).—A very dwarf slender-haulmed variety of Kentish Ashleaf.

Toddington Kidney (Horley).—A later, more robust, and very productive form of the Kentish Ashleaf.

Advancer (Bell & Thorpe).—Haulm, slender, compact, 12 to 15 inches long; stem, pale green; leaflets, small, pointed, pale green; flowers, very rare; tuber, short, flat, kidney-shaped; eyes, full; skin, smooth, pale, straw-coloured; flesh, pale, firm; moderate cropper; first early. Commended.

Jackson's Improved.—Haulm, spreading, 18 inches long; leaves, rugose, deep green. Growing later than the Kentish Ashleaf.

Cattell's Reliance (Cattell).—Haulm, moderately robust, spreading, 2 feet 6 inches in length; stem, pale green; leaflets, small, rugose, pale green; flowers, purple, sterile; tuber, medium-sized, of the general appearance of the Lapstone; eyes, few and small; flesh, white, very firm, of good quality. Ripe, September 2. Second early.

Cattell's Eclipse (Cattell).—Haulm, moderately vigorous, spreading, about 3 feet in length; stem, pale green; leaflets, rugose, pale green;

flowers, light purple, rare; tuber, medium sized, in shape like the Lapstone; skin, rough, pale straw; flesh, white, firm; quality excellent. A fine second early. First-class certificate.

Prince of Wales.—Synonym, The Barber (Dean).

Silverskin Kidney (Dean).—Synonyms, Sear's Seedling (Horley); Lady Abbess (Sutton); haulm, robust, spreading; 2 feet in length; stem, pale green; leaflets, small, rugose, pointed, pale green; flowers, large and handsome, white, abundant, fertile; tuber, medium-sized, long-cylindrical, rather coarse; eyes, few, scattered, small, deeply-sunken; skin, rough, pale straw; flesh, firm, white. A moderate cropper. Second early.

Waterloo Kidney (Dean).—Haulm somewhat resembling Myatt's Ashleaf.

Dawe's Matchless.—Synonyms, Webb's Imperial, Wormsley, Bryanstone Kidney (Veitch), and Manning's Kidney. —Haulm, strong, robust, of somewhat spreading growth, about 2 feet 6 inches high.

Excelsior Kidney (Dean).—A more erect-growing and much-improved form of Dawe's Matchless, producing a larger and finer sample. Extra fine quality. First-class certificate, 1873.

Queen of Canada (Stone).—A very large form of Dawe's Matchless.

Lapstone.—Synonyms, Haigh's Seedling, Cobbler's Lapstone, Almond's Yorkshire Hero, Pebble White, Headley's Nonpareil, Huntingdon Kidney, Yorkshire Hero, Perfection, Rixton Pippin, Ashtop Fluke, Welbeck White, Second Early, Ne Plus Ultra (Farquhar), and Early Kidney (Veitch).

Confederate (Veitch).—Haulm, robust, spreading, 2 feet in length; stem, tinged purple; leaflets, small, pointed, rugose, brightly green; flowers, abundant, pale lavender; tuber, very large, long, flattened, somewhat kidney-shaped; surface, smooth, even; eyes, few, small, full; skin a little rough, pale straw; flesh, firm, white. A heavy cropper and very handsome. Second early.

New Englander (Hooper).—Haulm, robust, erect, about 2 feet 6 inches in height; stem, pale green; leaflets, large, pale green; flowers, large, white, very abundant; tuber, large, long cylindrical; eyes, numerous, scattered over entire surface, small and deeply sunken; skin, smooth pale; flesh, firm, white. Moderate cropper. A very coarse looking Potato. The leaves decay from off the stem early in a singular manner, the stem remaining erect until it crumbles all away. Second early.

Model (Bell & Thorpe).—Quality excellent.

Shiner (Harrison & Sons).—Haulm, of the Regent character of growth, 2 feet 6 inches long; stem, tinged purple; leaflets, dark green, rugose; flowers, bluish-white, fertile; tuber, large, broad, flat, of the Fluke character; eyes, small, full; skin, pale straw-coloured, a little rough; flesh, close, yellow. A great cropper and handsome. General season.

§ 2. Half long.

President (Dean).—Haulm, slender, spreading, 2 feet long; stem, tinged with purple; leaflets, small, rugose, pointed; flowers, shaded, lilac; tuber, short, flat, very even and regularly formed; eyes, small, few; skin, pale straw-coloured, slightly rough; flesh, firm, white; very handsome. Moderate cropper. Second early Potato. Excellent quality.

Cooling's Early Favourite (Cooling).—Synonyms, Sutton's Early Defiance Kidney (Sutton), Flower's Early Wide Awake (Flower), The Shiner (Dean).—Haulm, robust, spreading, 21 inches long; stem, slightly tinged purple; leaflets, large, of the general appearance of Kentish Ashleaf; flowers very large, abundant, of a bluish colour; tuber, medium-sized kidney, hollow at crown end; eyes, situate on crown and on knobby protuberances like the Ashleaf; skin, clear straw-coloured, very handsome; flesh, close, pale straw-coloured. A very heavy cropper of inferior quality. Second early.

Cattell's Intermediate (Cattell).—Haulm, strong, vigorous, 3 feet 3 inches long; stem, pale green; leaflets, rugose, pale green; flowers, white tinged purple, fertile; tuber, medium, greatly resembling Paterson's Victoria, flattened, broader at one end; skin, rough, pale straw-coloured; flesh, firm, white. Mid season.

Bresee's Climax.—Synonyms, Gravenstein, Coppermine, Climax. Haulm, moderately strong, about 1½ feet long; stem, light green, spreading, branching. First-class certificate, 1873.

Snowflake (American) (Carter & Co.; Hooper & Co.; Bliss & Sons).—Haulm, moderately robust, compact, ripening early, 2 feet long; stem, pale green; leaflets, large, broad, pointed, very pale green; flowers, seldom opening; tuber, large, long-ovate, tapering towards the crown; very even and regular; eyes, small, almost level with the surface of the tuber; skin, pale, straw-coloured, rough; flesh, white, of good quality; a very heavy cropper. Early, and one of the most handsome of Potatoes.

Bresee's Prolific.—Synonyms, Brown's Prolific Kidney; Sutton's King (Farquhar).

Dwarf White (Bliss & Sons).—Haulm, compact, about 12 inches long, ripening off very early; stem, pale green; leaflets, broad, flat, very pale green; flowers, not opening; tuber, medium size, half-round, flat; surface, uneven; eyes, large, deeply sunken near crown end; skin, smooth, very clear, pale straw-coloured; flesh, firm, white, of excellent quality for early use; moderate cropper. One of the very earliest of Potatoes. First-class certificate, 1874.

Dourie Hall Favourite (Montagu).—Haulm, robust of Regent type, about 3 feet in length; stem, pale green; leaflets, large, broad, pale green; flowers, bluish-white, sterile; tubers, large, half-round, sometimes long; eyes, few; skin, a little rough, pale straw-coloured; flesh white, firm. Good cropper. Mid Season. Very distinct.

Paterson's Victoria.

Cattell's Late Nonpareil (Cattell).—This resembles Paterson's Victoria.

§ 3. *Round.*

Regents.—Synonyms, York Regent, Mitchell's Prolific, Early Oxford, Pink-eyed Regent, Rintoul's White Don, Scotch Don, Rusty Coat, Rough Jacket, Early Chinese (Veitch), Early White, Round Erfurt (Veitch), Early Don, Gryffe Castle (Harrison).—The above are varieties of the true Regent Potato, varying somewhat in point of earliness, and in cropping qualities. This, it is believed, is more due to change of soil than any permanent distinction. This is, perhaps, the best and most generally useful Potato in cultivation.

Dalmahoy.—Synonym, Goldfinder.

Walker's Early.

Rector of Woodstock (Fenn).—First-class certificate, 1872.

Fenn's Early Market.—First-class certificate, 1873.

Henderson's Prolific (Farquhar).—Haulm, spreading, moderately robust, 2 feet 6 inches long; stem, pale green; leaflets, pale green, rugose, resembling those of a Regent; flowers, pale lavender, fertile tuber, below medium size, round; form, even, regular; eyes, full; skin, clear, slightly rough; flesh, pale straw-coloured. A good useful early; Potato. Great cropper.

Tullinamoult (Farquhar).—Haulm, moderately robust, 21 inches long; stem, tinged purple; leaflets, small, crumpled, withering early; flowers, abundant, purplish-white, fertile; tuber, below medium size, round, flattened at crown end; eyes, rather deeply sunken; skin, smooth, pale; flesh, pale-straw coloured, firm. Moderately prolific. Second early.

Early Dimmisk (Farquhar).—Haulm, gross, spreading, 2 feet 6 inches long; stem, pale green; leaflets, large, broad, pale green; flowers do not open; tubers, very large, about five or six produced at each root, of form somewhat irregular, rounded, hollowed at stalk; eyes, small, full; skin, rather rough, pale; flesh, white, firm, of excellent quality. Second early. First-class certificate, 1874.

Irish White (McGann).—Haulm, like that of strong Regent; flowers, not opening; tube, medium round; eyes, small, very deeply set, giving the tubers a nobbly appearance; skin, pale, smooth; flesh, white, firm. A fair cropper. Late second early. A hardy vigorous Potato.

White Peach-blossom.—Synonym, Peach Blow (Carter).

Lockloy's Perfection (Burslem).—Haulm, robust, spreading, 3 feet long; stem, pale green; leaflets, rugose; flowers not opening; tuber, large, rounded, much flattened; eyes, chiefly situate at the crown, deeply sunken; skin, rather rough, pale; flesh, white, firm. A fair cropper. Mid season. A coarse looking Potato.

Prize of Holland (Veitch).—Haulm, moderately robust, 27 inches long; stem, pale green; leaflets, small, rugose, green; flowers, lavender and white; tuber, small, round; eyes, small; skin, nearly smooth, pale straw-coloured; flesh, yellow-coloured, small, and very inferior. Second early.

Series II.—Skin Red.

§ 1. *Long or Kidney-shaped.*

American Late Rose.—Synonym, American Pale Rose.—First-class certificate, 1873.

American Early Rose.

Extra Early Vermont (Bliss & Sons).—First-class certificate, 1873.

Rice's Seedling (Farquhar).—Haulm, very robust and gross, 2½ feet long; stem, green; leaflets, bright green, pointed; tuber, large, long, rounded, producing very numerous small ones, very uneven; eyes, small, deep, scattered; skin, rough, faintly shaded pink; flesh, white, coarse. A very coarse sort.

Bountiful (Fenn).—First-class certificate, 1874.

Early Red Kidney (Dean).—Haulm, slender, spreading 18 inches long; stem, pale green; leaflets, small, pale green, ripening early; tuber, long, slender, of a true kidney shape; eyes, few, small, full; skin, smooth, pale red; flesh, close, yellow. An early sort. Great cropper, and worthless.

§ 2. *Round.*

Red Emperor.—Synonym, Carter's Main Crop.

Vermont Beauty (Bliss & Sons).—Synonym, Brownell's Beauty. First-class certificate, 1873.

Welbeck Red (Tillery).—Haulm, very robust, 4 to 5 feet long; stem, tinged red, leaflets, rather small, pointed, rugose, light green; flowers, purplish-white, fertile; tuber, medium; form, even, round; eyes, small, deeply-placed; skin, rough, pale red; flesh, white, coarse-grained, good for late use. A great cropper. Was raised from Scarlet Prolific. Late.

Rufus (Harrison).—Haulm, very robust and gross, 3 feet 6 inches long; stem, tinged red; leaflets, large, pale green; grows very late; flowers, white, abundant, fertile; tuber, medium-sized; form, regular, rounded; eyes, small, full; skin, very rough, deep red; flesh, close, yellow. A handsome Potato, and a great cropper, but too coarse. Late.

Series III.—Skin Purple or Blue.

§ 1. *Long or Kidney-shaped.*

Precoce de Remy (Veitch).—Haulm, straggling, slender, 2 feet 6 inches long; stem, reddish; leaflets, small, rugose, deep green; flowers, not opening; tuber, small, true kidney-shaped; form, very even; eyes, small, skin dull, purplish-red; flesh, close, yellow. A poor cropper, and very worthless. Second early.

True Blue (Dean).—Haulm, slender, spreading, 18 inches long; stem, reddish; leaflets, small, rugose, deep green; flowers, white,

fertile; tuber, long, narrow, kidney-shaped; form, even; eyes, small, level with surface; skin, rather rough, deep purple; flesh, white, firm. Handsome. A moderate cropper. Second early.

Purple Ashleaf (Farquhar).—Synonym, Stafford Hall (Farquhar).—Haulm, moderately strong, resembling Kentish Ashleaf, spreading, 18 inches long; stem, tinged purple; leaflets, small, rugose, pale green; flowers, not opening; tuber, above medium size, long, flat; form, very even, kidney-shaped; eyes, very small, full; skin, smooth, reddish-purple; flesh, pale, with a dark streak through, close. A handsome-looking Potato, and a fair cropper. Second-rate quality. Early.

§ 2. *Round.*

Compton Surprise (Bliss & Sons).—Haulm, very robust and gross, 18 inches long; ripens off early; stem, green, tinged with red; leaflets, very large, broad, pale green; flowers, white, sterile; tubers, large, long, flattened, coarse in appearance; eyes, numerous, very deep, scattered over entire surface; skin, smooth, dark purple; flesh, white, firm. A moderate cropper. Mid-season.

Scotch Blue.—Synonyms, Duncan's Seedling; Summer Hill Seedling; Birmingham Blue (Dean).—Haulm, moderately robust, spreading, 18 inches long; stem, reddish; leaflets, broad, green; flowers, not opening; tuber, medium-sized, round; form, even; eyes, small, few, sunken at crown, which is depressed; skin, smooth, reddish-purple, deep purple in the eyes; flesh, white, firm. Moderate cropper. Greatly resembling Scotch Blue.

Surprise (J. White).—Haulm, very strong, 2 feet 9 inches long; stem, reddish; leaflets, small, rugose, deep green; flowers, purple, fertile; tuber, medium, round, flattened, depressed at crown; form, pretty even and regular; eyes, small, sunken; skin, smooth, deep reddish purple, deep violet round the eyes; flesh, white, firm. A good productive sort, and handsome. Late.

Skerry Blue (Sutton).—Haulm, very robust and vigorous, 4 feet long; stem, reddish; leaflets, small, rugose, green, with red veining; flowers, dark purple, very abundant, fertile; tuber, large, round, of coarse uneven appearance; eyes, large, deeply set; skin, rough, dark purple; flesh, close, yellow. A great cropper, and a hardy Potato, but very coarse. Late.

Series IV.—Skin Streaked or Flaked.

Barron's Perfection (Farquhar).—Haulm, moderately robust, erect, 2 feet long; stem, green; leaflets small, rugose, pale green; flowers, purple, very abundant, fertile; tuber, medium, long kidney-shaped, blunt at crown; eyes, small, few, mostly situate at crown; skin, smooth, occasionally rough, pale straw-coloured, generally flaked with brilliant crimson near the crown; flesh, white, close, of good quality. Very pretty. Moderate cropper. Second early. First-class certificate, 1874.

Cattell's Advancer.—Haulm, robust, almost erect, 3 feet long; stem, pale green, tinged purple; leaflets, broad, rugose, deep green; flowers, darkly purple, fertile; tuber, medium, half-long, flat; eyes, small, deeply set; skin, pale, straw-coloured, oblong, with a dash of purple near the crown; flesh, white, firm. A moderate cropper. Late.

Red Breadfruit.—Synonym, Old Scarlet Keeper (Taylor).—Fit for use late in spring.—"Royal Horticultural Society's Journal."

A SELECTION OF GOOD VEGETABLE SEEDS.

As gardeners and amateurs will soon be ordering their supplies of vegetable seeds for next year, perhaps a list of the kinds which I have found to be the most useful may be of interest to your readers. Seedsmen's catalogues now-a-days contain so many varieties, all described as first-rate, that it puzzles the uninitiated what to select. Of Cauliflowers, Veitch's Autumn Giant is a decided acquisition, and Walcheren, Early London, Lee's Imperial Dwarf, and Late Asiatic are all varieties that are sure to give satisfaction. Of Cabbages, Enfield Market, Wheeler's Imperial, Cocoa-nut, Cattell's Reliance, and the dwarf early kind, called Little Pixie, is good for planting close in the rows, as well as the rosette Colewort. Of Savoys, the dwarf green curl of the Globe, and its yellow variety, and Harrison's dwarf new kind, called King Koffee, I have found to be a good selection. Of Brussels Sprouts—the imported—Lee's Acme, a dwarf kind, and Scrymger's Giant are excellent sorts. Of Kales, Lee's dwarf, Curl'd Scotch, the Cottager's dwarf Abergeldie, and the Chou de Milan are all good and very hardy. Of early winter Broccolis, Snow's true Winter White, early Penzance, and Backhouse's Early are excellent; for early spring sorts, Dilcock's Bride, Frogmore Protecting, Watt's Excelsior, Cooling's Matchless; and, for the latest grown, the Leamington, Carter's Champion, and Cattell's Eclipse are all kinds which I can recommend. Of Lettuces of the Cabbage kinds, select All the Year Round, the Grand Admiral; and of the Cos section, Bath or brown Cos, Holmepark, King's Holme, and Paris white; for autumn sowing, choose Hick's Hardy White, the Hardy White Dutch, and the Hammersmith Hardy Green. Of Onions for autumn sowing, I find the best to be Giant Rocco, Globe Tripoli, and Danver's Yellow; and for the general summer crop, James' Keeping, Brown Globe, Deptford or Strasburg, and White Spanish or Bedfordshire Champion; these make as good a selection as can be grown. The Naples Early White, if sown very thick, comes in early for use in the summer, and for pickling. Of early

Turnips, the best is, the Strap-leaved, Early White, American Red Stone, and Veitch's New Red Globe. Of Carrots for forcing, use the French Shorthorns, and for the general crop early Shorthorn, James' Scarlet Intermediate, and long red Surrey, the Altrincham being the heaviest cropper, but it requires a deep soil. Of Kidney Beans the Negro Long-podded is a good early kind, and Canadian Wonder is a very long-podded sort, and excellent for the general crop; for forcing I find Fulmer's and Osborne's kinds the most productive. Of Peas innumerable varieties are introduced to notice, and growers can select from them either dwarf-growing or tall sorts, according to their means of procuring stakes for them. Of the dwarf sorts I prefer Little Gem, Multum in Parvo, and Blue Peter; and for early sorts of the taller section, William the First, Dickson's First and Best; and for the general crop, G. V. Wilson, Ne Plus Ultra, Veitch's Perfection, and British Queen. Of Beans I find the most productive croppers to be the early Long-pod, Green Windsor, and the Broad Windsor. Of Beets, Lee's Belvoir Castle, Dell's Crimson, and the New Chelsea. Leeks, the Ayton Castle Giant. Of Parsnips, the Hollow-crowned. Of Celery, the Leicester and Major Clarke's Red, and Sandringham and Incomparable White. WILLIAM TILLERY.

Welbeck.

POTATO-CROPPING EXTRAORDINARY.

LAST spring, Messrs. Bliss, of New York, offered premiums, "open to the world," and amounting in the aggregate to 1,500 dollars, for success with three new Potatoes, the object being as much to stimulate interest in improved methods of cultivation as to induce an extended trial of varieties, in the dissemination of which they were interested. The surprising achievements of those who competed for the 500 dollars in prizes of the previous year, together with the triple liberality of the new schedule, excited a wide-spread enthusiasm, and the cultivators who entered for the second contest were numbered by hundreds, and represented nearly every State in the Union, not to speak of some neighbouring provinces. The terms required that the crops should be raised in the customary way, no forcing processes being resorted to, or unusual method of multiplication; and competitors were given to understand that their statements must be duly witnessed and authenticated. These statements were promptly rendered, but, owing to illness of one of the committee, the awards have only just been announced. We present the main particulars in tabulated form, showing varieties tested, names and addresses of successful competitors, weight of crop, and amount of premiums. It is a series of apparently almost miraculous performances, but the trustworthy committee—Messrs. Geo. Thurber, F. M. Hexamer, and P. T. Quinn—assures us that, while abstaining from comment on the "astounding yields from single pounds," a "most careful and scrupulous investigation" has fully satisfied them of "the correctness of the statements." The following are the weights, &c., according to the "New York Tribune":—

FOR LARGEST QUANTITY EXTRA EARLY VERMONT FROM ONE POUND OF SEED.			
No. of prize.		lbs.	dollars.
1.—	Alfred K. Titus, Wilmington ...	708	100
2.—	J. I. Salter, St. Cloud, Minn. ...	698	50
3.—	Robert Lewis, Castleton, N. Y. ...	690	40
4.—	C. W. Walker, Washington, Kas. ...	674	30
5.—	A. W. Titus, Wilmington, Vt. ...	629½	20
6.—	Stephen R. DeWolf, Parrsborough, Nova Scotia ...	615½	10

FOR LARGEST QUANTITY COMPTON'S SURPRISE FROM ONE POUND OF SEED.			
No. of prize.		lbs.	dollars.
1.—	P. C. Wood, Esther, Ill. ...	900	100
2.—	Robert Lewis, Castleton, N. Y. ...	874	50
3.—	A. Loveless, White Mills, Penn. ...	832	40
4.—	J. I. Salter, St. Cloud, Minn. ...	811	30
5.—	C. W. Walker, Washington, Kas. ...	684	20
6.—	Chas. Whiting, Jasper, N. Y. ...	588½	10

FOR LARGEST QUANTITY BROWNELL'S BEAUTY FROM ONE POUND OF SEED.			
No. of prize.		lbs.	dollars.
1.—	H. C. Pearson, Pitcairn, N. Y. ...	1,018	100
2.—	A. Loveless, White Mills, Penn. ...	811	50
3.—	J. I. Salter, St. Cloud, Minn. ...	782	40
4.—	Robert Lewis, Castleton, N. Y. ...	749	30
5.—	Henry Bullis, Canton, N. Y. ...	720½	20
6.—	Charles Whiting, Jasper, N. Y. ...	696½	10

FOR LARGEST QUANTITY EXTRA EARLY VERMONT, GROWN ON ¼ ACRE.			
No. of prize.		lbs.	bush. per acre. dollars.
1.—	D. Steck, Hughesville, Penn. ...	6,247	416 28-60 100
2.—	Jeff. C. Hoch, Kutztown, Penn. ...	2,642	176 8-60 50
3.—	A. Hewlett, Kent, Ohio ...	2,584	172 16-60 40

FOR LARGEST QUANTITY COMPTON'S SURPRISE, GROWN ON ¼ ACRE.			
No. of prize.		lbs.	bush. per acre. dollars.
1.—	Mrs. M. A. Royce, Home, East Tenn. ...	7,350	490 100

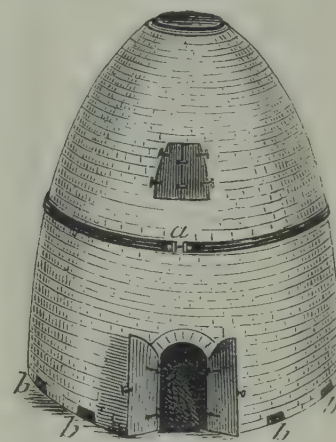
FOR LARGEST QUANTITY BROWNELL'S BEAUTY, GROWN ON ¼ ACRE.			
No. of prize.		lbs.	bush. per acre. dollars.
1.—	A. Rose, Penn Yan, N. Y. ...	8,899	593 16-60 100
2.—	D. Steck, Hughesville, Penn. ...	8,055	537 50

The committee explain that for the second series of premiums there were so few entries that every competitor receives a prize, so that this can scarcely be considered a test of the yield per acre of the respective varieties. This is to be regretted, as it was expected, and very naturally, that the more valuable information would be

derived from the reports of the modes of culture by which large crops are produced on a given surface, than from those showing how one pound of seed is multiplied a thousand-fold. From data at hand the committee say they find that there were many larger yields from quarter acres by non-competitors than by some of those who received prizes. The unfavourable season and devastations of the Colorado beetle diminished to such a degree the crops of many who intended to compete, that they did not feel warranted in entering upon what they considered a hopeless venture. Of the merits of the Potatoes, as developed under this later and more extended test, it is said that there is general acknowledgment of the superiority of the Vermont as an early variety, both for market and table, in fact, "the earliest and best in cultivation;" that Compton's has given not less satisfaction as a Potato of the highest quality, and that Brownell's Beauty, the newest of the three, has made "a splendid record," not only giving "much the largest returns," both from the single pound and the quarter acre, but eliciting "unanimous praise from all cultivators."

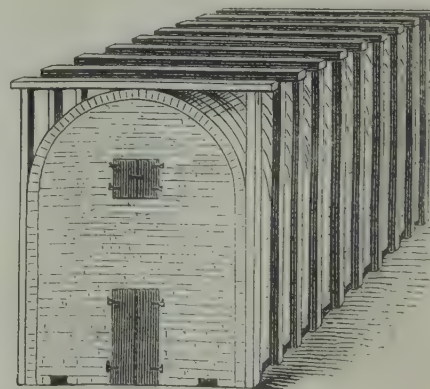
KILNS FOR CHARCOAL.

The common method of making charcoal in pits—that is, in conical heaps covered with a layer of leaves and earth—is here abandoned, and kilns are substituted for the pits. These kilns are made of



Conical Charcoal Kiln.

brick, one course being sufficient if bands of iron or timber framework be added to strengthen the brickwork. The most prevalent style of kiln is the conical shaped, as shown in the accompanying cut. A usual size is 24 feet in diameter, with an equal height, holding about 40 cords of wood. This size has been found to be the most economical. The cost of one of these kilns, complete in every respect, with a lining of firebrick for 10 or 12 feet up from the bottom, was £240. The wood turns out more coal than when burned in pits, and 43 to 45 bushels of coal to the cord have often been made with first quality hard wood. The extra yield and less cost



Square Charcoal Kiln.

give a very good profit upon the cost of the kilns. The wall of the kiln is carried up nearly straight for 6 feet, when it is drawn in and made to form a blunt cone. Upon the top a plate of iron is fastened in the manner of a key-stone to an arch. Bands of 3-inch hoop-iron, an eighth of an inch thick, are placed around the kiln, and drawn together (a) with screw bolts and nuts to strengthen it. There are double sheet-iron doors at the bottom and near the top of the kiln, by which it is filled with wood or emptied of coal, and a few air-holes (b), which may be stopped up with loose bricks, are left in the bottom. When the kiln is filled it is necessary to plaster over the cracks of the doors or any that may exist in the brickwork with well-tempered clay to exclude

air. The second figure shows a kiln of another shape, made to burn over 3,000 bushels of coal and holding eighty cords of wood. It is a parallelogram in shape with an arched roof, and strengthened by a framework of timber 10 inches square. The walls of this kiln should be a brick-and-a-half thick to stand the pressure of the gas which sometimes accumulates within and occasionally bursts one of them with great force. A usual size is 40 by 16 feet and 16 feet high, outside measure. These larger pits need four weeks for a round—that is, to be filled, burned, and emptied; the smaller ones require three weeks, which is about the time needed to “coal” a pit. —“New York Tribune.”

GARDENING FOR THE WEEK.

The Flower Garden and Pleasure Grounds.

Now that the weather has become mild the pruning and thinning of shrubberies, &c., may be at once proceeded with. The beauty and graceful outline of many valuable trees and shrubs are often irretrievably destroyed owing to the reluctance felt to remove or to cut back other plants which may be unduly pressing upon them. In very many instances, when belts or clumps of trees and shrubs are planted with the view to obtaining a desired effect at the earliest possible period, more plants are put in than are really necessary, or more than can, in the course of a year or two, find sufficient space to develop themselves; and it also happens, not unfrequently, that the necessary attention is not given to the arrangement or distribution of the plants in the first instance; consequently, two, or even more, valuable specimens are sometimes found growing so close to each other, that all are suffering more or less from crowding, and the dislike of removing or destroying any of the plants so circumstanced tends, in the long run, to disfigure and ultimately to destroy all. All this, however, may easily be avoided by bestowing a little care and attention upon the matter when the plantation is in course of formation. All valuable sorts, such as the various kinds of Cupressus, Juniperus, Retinosporas, Thuja, Thujopsis, Yews, Aucubas, Alaternuses, Arbutuses, variegated Hollies, &c., should be planted, in the first place, at such distances from each other (say 15 or 20 feet at the least) as would afford sufficient space for each specimen to attain its natural form and dimensions; while, to produce a finished or an immediate effect, the intervening spaces should be filled in with the more common varieties of evergreen and deciduous shrubs, such as the common and Portugal Laurels, Green Hollies, Lilacs, Spiræas, &c., which should be gradually cut away from time to time, as found necessary, in order to give space to the more valuable specimens, as they continue to require the same. Examine clumps or belts of Rhododendrons and other American plants, and if any of the more delicate varieties are being overgrown by the more vigorous-growing sorts, let them be cut away to the necessary extent, or removed altogether. It is in many instances advisable to lift and rearrange plantations of this kind about once during every three years, unless the plants have already attained dimensions which will not admit of its being done. Where, however, the plants are of moderate size, they may be moved at almost any season, with little or no risk, as their roots seldom extend far, and this circumstance renders it easy to transplant them. The present weather is also very favourable for the prosecution of any alterations or improvements which may be contemplated in the grounds or gardens, which necessitate the removal of soil, and the laying of turf, &c. All such work should, when the weather is favourable, be pushed forward with all possible despatch; as such work, if delayed until the season is considerably advanced, greatly interferes with the general routine of necessary operations, and it is quite impossible to keep a place in first-rate order while extensive alterations are in progress. Sweet Peas to flower early, if not sown early in November, may be sown now; and wherever the amount of stock of any kinds of bedding plants is limited, such may now be placed in gentle heat, in order to induce the production of material to form cuttings at the earliest period possible. Where Tricolor and other delicate variegated Pelargoniums were lifted from beds in the open air, and potted with a portion, or all, of their shoots remaining upon them, these shoots may now be taken off, and formed into cuttings, inserted singly into 3-inch pots; or larger pots may be used, and several cuttings may be inserted in each, to be potted off singly when rooted. The soil used should be a mixture of light loam and leaf mould, about two of the former to one of the latter, and a pinch of silver-sand should be dropped into each hole, before the cutting is inserted. The pots containing the cuttings should be placed on shelves, or on a bed of cinder ashes, in a temperature of about 65°. Bottom-heat is not necessary; and, if the soil used is moderately moist, no water should be given during the first week or ten days. Cuttings of the Tricolor Pelargoniums are generally found to root

somewhat slowly; consequently, it is necessary to insert them thus early, in order to have the plants of a useful size when the time arrives for planting them out. The beginning of March, however, is not too late to insert cuttings of all the green-leaved sorts. Dry roots of choice Dahlias may also be potted now, with a view to the production of cuttings; and seed of the Golden Feather Pyrethrum may be sown in pans or pots, and placed in a greenhouse temperature. —P. GRIEVE, *Culford, Bury St. Edmunds.*

Winter-flowering Carnations.

What are called tree or perpetual Carnations are now in full bloom in many places, and are most useful for button-hole bouquets or for specimen-glasses. Carnations of this class are easily cultivated, and the great quantities of red and white flowers which they produce are truly astonishing. The varieties which I find do best with me are Garibaldi, Life Guardsman, Valliant, Hubert, Vulcan, Clarabelle, Bewitching, La Belle, Miss Jolliffe, White Rival, Avalanche, Prince of Orange, and Golden Eagle, all thoroughly good winter-flowering kinds. Cuttings or pipings of these and others should be struck early next month. In order to have good flowering plants in autumn and winter, I select the best and strongest wood for cuttings, which I insert in a large 60-sized pot, placing from five to six cuttings round the edge. I plant them moderately firm, and then place them in a bottom-heat of about 75° or 80°. In a month or five weeks' time they will be found to be thoroughly rooted, and fit to pot off in small 60-sized pots. In making the cutting or piping, after determining the length required, the two lower leaves should be thoroughly peeled off the wood, leaving nothing but clear soft wood below the joint; then, with a sharp knife, cut close up to the joint. The best soil in which to strike such cuttings is loam and leaf mould, or loam and cocoa-nut fibre, with plenty of sand. I have often even struck them in cocoa-nut fibre alone. As soon as they are well rooted, pot them off in small 60-sized pots, selecting for the purpose some good loam free from wire-worm, and well mixed with plenty of sand. Place them in a frame on a slight bottom-heat until well rooted, keeping them close to the glass, in order that they may not get too much “drawn.” When thoroughly rooted, give them another shift into small 48-sized pots, and, while in these, “stop” them, so as to make them bushy and cause them to form more spikes. May is the best month in which to give them a general stopping. About the end of June I give them their final shift into large 32-sized pots, and, if they are unusually strong, a size larger may be used; but nothing is gained by using too large pots, for they must be thoroughly rooted—indeed, pot-bound—to flower well. The soil for the final shift should consist of good fresh turfy loam and sharp sand, and the pots should be well drained. When shifted into 48-sized pots, I set them in a cold pit; and, when finally shifted into their flowering-pots, they are placed out of doors on a north border. Staking as required, and occasional waterings with soot-water, are all that is needed until the end of October, when they should be carefully brought into pits or houses, in which they will flower all winter. The Clove, one of the most useful of all Carnations, will succeed perfectly if treated as has just been described. It should be struck early in spring, and grown on, when fine flowers may be obtained by Christmas or New Year's Day. Old plants, if planted out, will furnish a good supply of flower throughout the summer. It is not advisable to depend on the same plants flowering well two years running.—H. G.

Orchids.

From amongst these the warmest nooks in our conservatories are being supplied with their most showy flowers. Oncidiums, Odontoglossums, and Coelogynes, are in great beauty, and these, together with Phalænopsids, furnish masses of white flowers, orange and crimson and allied colours being furnished by Masdevallias, Adas, Sophronitis, Epidendrums, Barkerias, &c., whilst Cattleyas, Vandas, Saccolabiums, Lælias, Dendrobiums, Phajus, Restrepias, &c., afford an immense variety of both colour and form. Prepare materials for a general potting next month and the succeeding one. Begin to pot, as soon as practicable, Odontoglossums, Miltonias, Masdevallias, &c., and those not requiring this at present should be top-dressed. Any bulbous Calanthes—those of the vestita section—not yet placed at rest, should be laid on their sides and kept dry. As soon as any appearance of growth presents itself in the earliest-rested plants, re-pot them, and place them under growing conditions. Give the terrestrial Calanthes plenty of water when they require it, and if they are in vigorous condition a little weak manure-water will be very beneficial to them. Dendrobium nobile being now, as a rule, well set with flower-buds, may be forwarded by introducing some plants of them into a brisk temperature, and others may be retarded by keeping in rather a cool house or pit. Attend to the destruction of all kinds of insects, as their numbers can be more easily and conveniently reduced than later on in the season. Scale, green fly,

thrips, ants, mealy bug, red spider, woodlice, and wire-worms require attention. Keep Pleiones in a nice growing state; any of the varieties that have not finished blooming should be re-potted as soon as their last flowers are past. Maintain a moderately moist atmosphere in all the Orchid-houses, otherwise Phalaenopsids and other long aërial-rooted species will suffer.

Indoor Fruit Department.

Vine Eyes.—Those potted about a month ago should now be plunged in a bottom-heat of 80°; any corner that will hold them and furnish that temperature is suitable. They come away rapidly when plunged here and there in an early Queen Pine bed, but a heated frame serves the same purpose. Should any of them be dry, supply them with water not colder than the surrounding temperature. If deficient in number, eyes may still be made and be potted and plunged with the others. The root-pruning or turf-raising system, which originated at Dalkeith many years ago, may be practised by everybody. Six-inch squares of turf should be cut, the eye placed in the centre, and a number of them set in a wooden box; when, if the whole be put on the top of the hot-water pipes in a Vinery or any other structure, growth soon follows. These need no root-pruning, as the roots do not emerge from the square. When grown thus, care must be taken that the turf does not get too dry; if this should happen each turf should be lifted out separately and dipped in a pail of water. Another method is to fill a common propagating box with soil to the depth of 4 inches, place the eyes 6 inches apart in this, and treat them as in the former case until they have attained a height of 18 inches, when a large knife should be run through between each row, going down to the bottom at every cut; six days afterwards they should be cut similarly in an opposite direction. This forms them into squares by cutting all the long leading roots, which soon produce a host of rootlets from each stop. They should be lifted apart or be taken out and potted or planted before the roots again run into one another's squares. Where large quantities are grown the bed of a propagating-pit or Pine-stove may be used instead of boxes. In preparing the eyes for this system they should be planted from both ends. It is necessary to make a small hole in the soil and lay the eye flat, leaving the bud above ground. This turf-growing or root-pruning need only be practised on those intended for planting, as it is simply done with a view to preventing the roots from running into long unfurnished leaders or coiling into entangled masses around pots. For fruiting in pots it is immaterial whether the roots are coiled or not, provided there be plenty of them, without which no Vine will fruit satisfactorily.

Pines.—Avoid letting any water come in contact with or rest about this fruit while in bloom; inattention to this results in deformity. Holes and distorted development, which are sometimes seen in Pine fruit, arise from this kind of mismanagement, and nothing renders fruit more unsightly. In looking over suckers which were put in early in autumn those with their pots full of roots should be shifted into others a size larger, or they may start into fruit prematurely. When re-potted do not plunge them in a bottom-heat over 75°, as it is not yet time to encourage much growth in them. If too late, Early Queen fruit may be hurried on in a higher temperature after they have done blooming. Smooths and other kinds supplying fruits until the Queens are ready should receive careful watering and be otherwise closely watched. A little air admitted during sunshine, and a slight damp overhead when shutting up, greatly helps the fruit to swell freely.—J. MUIR.

Kitchen Garden.

Peas, started in gentle heat under glass, should not be allowed to draw up weakly; on the contrary, when about half an inch high, they should be removed to a cold frame to be hardened off. In sowing Peas on a south border, if the border is narrow, either draw the drills parallel with the wall or fence, or else, which is better, run them obliquely across the border so that the rows may range from south-east to north-west, in which aspect they will get the full benefit of the sun. Even early Peas should have plenty of room, at least 4 feet from row to row, and two rows of Brown Cos Lettuce should be put in between each two rows of Peas. Autumn-sown Peas, that are now up, should have a ridge of earth drawn up on each side of them, and they should have sticks placed to them, which alone will form a great protection; but, in addition, Spruce, Fir, or Yew branches may be placed on the windward side of them whenever cold weather is anticipated. Scatter soot freely over and about them; this not only keeps sparrows and slugs at a distance, but also strengthens their growth. Draw the lights off Cauliflowers in frames every fine day, and give air freely to those under hand-lights during mild weather, dressing them at the same time freely with soot or wood ashes. Cauliflower plants in pots on shelves in heat near the glass should be moved to cold frames to harden off. If

there is space indoors, a few of the strongest might be shifted into larger pots for early use. Lettuces planted in slightly heated frames or pits last November will now be turning in, and should be tied up to blanch in succession. Sow a few Lettuces, either on a hotbed or in a few boxes placed in gentle heat; at the same time, also, some Lettuce seeds may be sown in a warm position at the foot of a south wall. Give air freely to forced Asparagus, when fairly through the soil, to colour and flavour it; if the weather is sunny and drying, give a light watering, occasionally, of weak liquid manure, in which about 2 ounces of salt to the gallon has been dissolved; continue to mat up at nights, as, although the days may be mild, the nights are uncertain. Where young Onions are required for flavouring salads sow the Queen, or the common Silver-skinned, in boxes in heat. Sow also, at the same time, the same kind on a warm border for succession; or a few roots of Chives may be lifted from the border, planted in boxes, and brought on gently in heat for the same purpose. Pot in succession Mint, Tarragon, Borage, Balm, &c., to meet any demand likely to arise. Sow a little Basil in heat for early use, and Sweet Marjoram if no supply was secured in boxes in autumn. Make up a hotbed for early Turnips in the following manner: dig out the soil, in a warm sheltered place, 1 foot deep, and 6 or 8 feet wide, extending as far in length as is considered necessary, and casting the soil about equally on each side; fill the space so excavated with hot dung, or dung and leaves, treading it well down, and laying the bed with a slope to the south; return about 6 or 8 inches in depth of the soil, and rake it down to a fine tilth; draw drills 6 inches apart, and sow the early Strap-leaved Stone Turnip thinly; fill in the drills with sifted material saved for such purposes when the rubbish-heap was charred. Where leaves and dung are plentiful, ungenial soils may in this way (with a little extra labour) be made as productive, and much earlier than even the most favoured localities; and, where this mode of supplying earth-warmth can be assisted by top-coverings of glass, or, where glass is not available, by oiled calico, or light handy frames made of stout laths thinly and neatly thatched with straw or reeds—the thatch to be neatly secured to the frame with thin tar-line—success may be rendered certain, as the ground will be kept from freezing, and germination and growth go steadily on. The covers should be taken off every fine day after the young plants come up, and be put on again at night. Of course early Carrots, Turnips, &c., should be left much thicker than will be desirable further on in the season. As they will be used in a young state, the largest being drawn first leaves room for the remainder to grow. A good many dishes can be obtained from a small bed if a small-topped sort is sown.—E. HOBDAV.

Early Spring in a Paris Market Garden.

The frames and cloches are treated in the same way as during last month; all the glass is now out of doors. Air is given to the frames on the leeward side, and to the cloches always on the south side. All the hotbeds for frames should be finished; any others made after this are for cloches or the open air. Clear out the spent manure from Melon trenches of the preceding year, and use it on beds. Dig over and manure where necessary; rake the borders over, and surface-dress them with spent manure.—*Sowings*: In hotbeds under cloches and in the open air, Carrots, pink and red Radishes; in the borders and intermediate beds, Carrots and Radishes; in cold beds, under frames and cloches, Sorrel, Parsley, Chervil, curled Chicory, wild Chicory, Cauliflowers, some early Cabbage, Milan Cabbage, red Cabbage, Brussels Sprouts, Egg-plants, Asparagus, Borage, bulbous Chervil, Celery for the table; in hotbeds, curled Chicory, white Celery, Beans, Cress, French Beans, Cabbage Lettuces, Roman Lettuces, Melons, Potatoes, Capsicum, Parslain, Tomatoes; in the open air, red Onions and green Peas.—*Plantings and transplantings*: Plant black-seeded Lettuces and green Roman Lettuces in hotbeds under cloches or frames; Georges and Gotte Lettuces in cold beds, under frames and cloches; grey and red-seeded Lettuces in the borders and intermediate beds; in hotbeds in the open air plant Flageolet French Beans, and transplant the Melons sown last month; plant out seedlings of last month, such as Cabbages and white Onions; plant Garlics, Shallots and Chives, *Treatment of Growing Plants*.—Continue to supply some manure to Asparagus and Mushrooms. Fill up the alleys, re-make the shelter-heaps, water the hotbeds if they are too dry, remove decayed leaves from Cabbage and Roman Lettuces, weed and give air to the frames during the day, and cover them at night. *Crops Gathered*.—The first crops from the hotbeds, consisting of Cabbage Lettuces in abundance, black and red Radishes, Spinach, green Roman Lettuces, and Asparagus. Blanched and green Cardoons, Carrots, white and turnip-rooted Celery, Chervil, Mushrooms, wild Chicory, Milan Cabbage, Scallions, green Pumpkins, Cress, Spinach, Tarragon, Corn Salad, Turnips, Sorrel, Parsnips, Parsley, Dandelion, Leeks, Pink, red and black Radishes, Rampion, Salsafy, and Scorzonera,

are, as in January, the principal crops which are gathered this month. *Special Remarks.*—The open-air hotbeds may be replaced by hotbeds with cloches, and *vice versa*; the frames on cold beds by a bed of Rampion, the Celery by Cabbages, the Spinach by Onions, the sloping bed by a bed prepared for the early Melons, the white and turnip-rooted Celery by Flageolet French Beans, the Chives by Chervil, the Cabbages by white Celery, the Scallions by Melons and Tomatoes planted out, the white Celery by Scallions, the white Onions by a sowing of Spinach and small Salad. In the borders early Cabbages may be planted, and white Onions sown between them.

NOVELTIES FOR 1875.

Rheum nobile, Hooker.—Of this remarkable species of Rhubarb, till now unknown in our gardens, I am gratified in being in possession of fresh seed for the first time. This is a native of Sikkim, where it was originally found by Dr. Hooker, in whose valuable Himalayan journals it is thus described:—"The individual plants of *Rheum nobile* are upwards of a yard high, and form conical towers of the most delicate straw-coloured shining semi-transparent concave imbricating bracts, the upper of which have pink edges; the large bright glossy shining green radical leaves, with red petioles and nerves, forming a broad base to the whole. On turning up the bracts the beautiful membranous fragile pink stipules are seen like red tissue paper, and within these again the short branched panicles of insignificant green flowers. The root is very long, often many feet, and winds among the rocks; it is as thick as the arm, and bright yellow inside. After flowering the stem lengthens, the bracts separate one from another, become coarse red-brown, withered and torn; finally, as the fruit ripens they fall away, leaving a ragged-looking stem covered with panicles of deep brown pendulous fruits. In the winter these naked black-stems, projecting from the beetling cliffs, or towering above the snow, are in dismal keeping with the surrounding desolation of the season.

Brodiaea volubilis, Baker (*Stropholirion californicum*, Torrey).—This species is remarkable for its twining habit, the flower-scape often reaching the height of 7 or 8 feet, or even more. The flowers are produced in terminal umbels of from fifteen to thirty each, the perianth being of a light rosy-purple colour, nearly 1 inch long, of a tubular ventricose form, contracted below the mouth. The foliage is linear, somewhat fleshy in character, and from 12 to 18 inches in length. It is perfectly hardy, and of the easiest cultivation in any soil, but will probably succeed best in sandy loam. Seedlings will bloom the third year of their growth.

Centaurea americana var. **Hallii**.—This showy variety differs from the typical species, the *Plectrocephalus americanus* of Don, in nothing but its deep rich purple colour, which renders it much more ornamental than the ordinary pale lilac form. It does not appear to have originated from cultivation, but is a wild form received from Texas, having been collected by Mr. E. Hall, whose name it appropriately bears. It succeeds best in rich deep soil and warm situations.

Chlorogalum pomeridianum, Kunth.—This is an interesting plant of the easiest management. It forms large tunicated bulbs, invested with a mass of black hair-like fibres, which are said to be used for stuffing mattresses, and the bulbs themselves are so alkaline and mucilaginous that the plant is popularly known as the Soap Plant, and is not unfrequently used for detergent purposes. The leaves are broadly linear, somewhat channelled and recurved, with wavy margins; amidst them arises a rather slender scape, 2 to 3 feet high, with several spreading branches, along which the numerous white flowers are arranged in loose racemes. They are about 1 inch across, with spreading segments, and open only in the afternoon, as the specific name implies; but one blossom expands at a time on each branch. In dry soils it is apparently quite hardy. Seeds vegetate very readily, and the bulbs grow freely when sufficient space is afforded them, but several years usually elapse before they attain a flowering size. It is a native of California.

Eriogonum compositum, Douglas.—This is a vigorous-growing species, with large ovate-cordate, stalked foliage, chiefly radical, dark green above, densely tomentose on the under surface, and naked scapes about 1 to 1½ feet in height, bearing a large, much divided umbel of whitish flowers, having at a little distance something of the aspect of the inflorescence of a *Spiræa*. Being perfectly hardy, and easy of cultivation, it will prove a desirable addition to the perennial flower border. The seed-like fruits are larger than in *E. umbellatum*. It is a native of Oregon and Northern California.

E. racemosum, Nuttall.—Although less robust than the preceding, this species is fully equal to it in interest—if it does not exceed it, owing to the delicate rosy tinge of its flowers. It produces from a woody root a tuft of ovate-oblong stalked leaves, which are about 2 inches in length and woolly beneath. From their

midst arises a naked forked scape, from 1½ to 2 feet high, with erect branches, bearing numerous white flowers tinged with rose, about as large as *E. umbellatum*. It is a native of New Mexico and Utah.

Galactites tomentosa, Moench.—Among plants remarkable for their ornamental foliage, the *Galactites tomentosa* deserves honourable mention. It is a Composite indigenous to the shores of the Mediterranean, growing from 2 to 3 feet high, of erect branching habit, with spiny divided foliage, prettily blotched with white, in the manner of *Silybum Marianum*, nearly smooth above, but very cottony and white on the under surface. The stems and branches are terminated by solitary flower heads of a lilac-purple colour. If sown as early as February, the plant blooms the first season, but stronger specimens are obtained by sowing in autumn. It succeeds best in good loamy soil.

Lobelia subnuda, Benth.—Some plants, like individuals, attain notoriety from the earliest moment of their introduction; whilst others of equal merit are unaccountably ignored, and reach celebrity only after the lapse of years. To the latter class belongs this little plant, for although cultivated in Germany, and offered in seed catalogues under the *alias* of *L. picta* during the last five or six years, it does not appear to be at all known in England. Its chief merit consists in the character of its foliage, which forms neat spreading tufts 4 inches in diameter or more, each leaf being about an inch in length, of an ovate form, doubly serrated at the margin, of a deep purple on its under side, and of brownish-purple colour above, the mid-rib and veins being green, thus affording a pretty contrast of tint, approaching that seen in some species of *Anætochilus*. There is a little variation in different specimens, some exhibiting a more decided opposition of colour than others, but in all it is more or less marked. The flowers are comparatively small, of a very pale blue colour, and are freely produced on erect branching stems about 6 inches high. They add but little to the attractions of the plant, and may be removed when seeds are not required. It appears most at home in the greenhouse, but will probably succeed fairly in the open border, during the warmer months of the year, where the purple tints of the foliage will be deepened, and its size somewhat diminished. If tried out, it should be planted in half shaded places. A native of Mexico.

Mentzelia ornata, Torrey and Gray.—This may be popularly described as a robust *Bartonia*-like plant, 2 to 4 feet high, with sinuate-pinnatifid foliage, rough, like the whole plant, with short barbed hairs, each branch bearing several white flowers 4 to 5 inches in diameter, with ten spreading acute petals, and a large central tuft of stamens from 200 to 300 in number. It is probably a biennial plant, and expands its splendid sweet-scented flowers towards the close of the day. Though long since figured in the "Botanical Magazine" from dried specimens, under the name of *Bartonia decapetala*, it has not, I believe, been in actual cultivation. The seeds are of an oval flattened form, bordered by a narrow wing, and are about one-sixth of an inch in length. If sown early, seedlings might possibly flower the first season.

M. nuda, Torrey and Gray.—Like the preceding, this species has a tall stem, rough from minute barbed pubescence, with lanceolate, or oblong-lanceolate, sessile toothed foliage, and large ten-petalled flowers, which differ from those of *M. ornata* in their yellowish colour and rather smaller diameter, being usually about 3 inches in diameter. If sown early it will bloom the first season, but it will probably bloom in greater perfection when treated as a biennial, as the flower would then be produced in the long summer days, instead of the cooler and shorter ones of autumn.

M. multiflora, Nuttall.—This species is readily distinguished from both the preceding by its dwarfer habit and golden-yellow colour of the flowers, which features, notwithstanding their smaller size, may make it quite as acceptable in European gardens. In its scabrous whitish stems, lanceolate pinnatifid foliage, and winged seeds, it does not widely differ from *M. nuda*. Whether vespertine or diurnal is uncertain, but plants would probably flower the first year.

Pentstemon Palmeri, Gray.—This handsome species is of robust habit, attaining, in good soil, a height of from 3 to 5 feet. The lower leaves are petioled, varying in form from ovate-lanceolate to spatulate, coarsely and sharply toothed; those of the stem broadly ovate, entire, and semi-amplexicaul, or sometimes even connate, all being of a fleshy texture, and, like the whole plant, smooth and glaucous. The flowers are borne in a many-flowered naked panicle, from 18 inches to 2 feet long; the corolla, which is peach-coloured, being remarkable for its short inflated tube and gaping mouth, as well as for the long reflexed lobes of the lower lip, each marked by a central reddish line, and the conspicuous projecting yellow-bearded sterile filament. It is quite hardy, and will succeed in almost any well-drained soil.

P. cyananthus Brandegei, Hooker.—The *Pentstemon cyananthus*, of which our present plant is but a form, is itself

regarded by Dr. Gray as but a broad-leaved variety of *P. glaber*; it is, therefore, somewhat difficult to seize upon characters sufficiently prominent in a botanical sense to warrant the separation of a new form. Many plants, however, which can scarcely be distinguished botanically from allied forms, are yet, in a horticultural point of view, sufficiently distinct, and deserving of a specific designation; and this is likely to be the case with the *P. cyananthus* var. *Brandegei*. On the authority of Professor Porter, it is said to differ from the allied forms in being minutely puberulent, in having a more robust habit of growth, in its broader foliage, and larger thyrsoïd spike of flowers, which are of a beautiful bright azure-blue. It is probably as hardy as *P. glaber*, and will succeed with the same treatment, seedlings flowering the second season.

W. THOMPSON.

Ipswich.

OBITUARY.

WE have this week to record with much regret the death of Mr. William Port Ayres, an event which took place at his residence, Forest Hill, on Thursday, the 14th inst. Mr. Ayres, as is well known, was an able writer on all matters connected with gardening. In discussions on horticultural subjects of all kinds he generally took part, and, owing to his long experience as a skilful practical gardener, the decisions at which he arrived were, as a rule, correct. He was elected a corresponding member of the Royal Horticultural Society, and was for some time editor of the farming and gardening portion of the "Nottingham Daily Guardian." While at Nottingham he took out patents for certain improvements in hot-house building, a business to which his whole time and energies were of late devoted, and one in which, just when success had been reached, he was struck down by disease, which in a few months reduced his manly frame to a mere shadow, and to which he ultimately succumbed. He belonged to a race of good gardeners, his father having been a skilful cultivator, and, in days gone by, a prominent exhibitor at the great shows then held at Chiswick. He was born at Shipley, in Derbyshire, and died at the comparatively early age of fifty-nine.

Mr. A. Turnbull, of the firm of Dickson & Turnbull, nurserymen, Perth, died at Bellwood, Perth, on the 19th inst. He was born in 1789, and, after having completed his education, joined his uncle in the nursery and seed business at Perth, which has now been carried on for upwards of half-a-century. By his death the local institutions of Perth will lose a warm and generous friend, for he was ever ready to assist them when necessary. Notwithstanding his great age, he continued to maintain his health and vigour till the closing days of his life. On New Year's Day he felt so strong that he made a good many calls; but, as in the case of many other old people, the severe cold was too much for him, and he was attacked with bronchitis, from which he never rallied. Mr. Turnbull has a wide circle of relatives and friends in Perthshire and neighbouring counties, by whom his loss will be deeply felt.

We have also to record the death of Mr. Buckley, who was for many years manager for Messrs. Rollisson, of Tooting. His acquaintance with plants and plant culture was extensive, and fully recognised by the large numbers of professional friends with whom his position brought him in contact. He died on the 18th instant, after a long illness.

PERSONAL.

WE are pleased to state that the health of Mr. Henry Ormson, the well-known horticultural builder, which has been for some time past in a precarious state, is now completely re-established.—Mr. Stevens, late foreman to Mr. Penny, at Sandringham, has been selected to take charge of Major Barton's fine establishment at Straffan House, Kildare.—Mr. Lee, late of Oteley Park and formerly of Blenheim, has been appointed successor to Mr. Brown, deceased, at Powis Castle, Welshpool; and Mr. Pritchard, late foreman at Shipley Hall, Derby, succeeds Mr. Lee at Oteley, Shrewsbury.—Mr. Dell, for many years gardener to Sir John Pakington, now Lord Hampton, is to succeed Mr. Smith at Lord Dartmouth's, Patshull, Wolverhampton.—Mr. Henderson, late of Sir Hy. Peek's, Wimbledon House, has taken the management of the gardens of John Deacon, Esq., Mabledon Park, Tunbridge; and Mr. Ollerhead, late of Killermont, Glasgow, has succeeded Mr. Henderson at Wimbledon.—Mr. Morley, formerly with E. J. Coleman, Esq., Stoke Park, Slough, has succeeded Mr. McFarlane at C. Lucas's, Esq., Warnham Court, Horsham.—Mr. T. Williams, for twenty years superintendent of the indoor gardens at the Crystal Palace, having relinquished the appointment, is open to an engagement for similar duties in a large public or private garden.—It has been arranged that the competition for the Carter Cup and other prizes, offered by Messrs. James Carter & Co., will take place on the 7th of July in the Royal Horticultural Society's Gardens, South Kensington.—With the view of encouraging other amateur growers of succulents to show their plants this season, Mr. Peacock has determined not to compete at any of the exhibitions this year.—On the occasion of the opening of the Museum of Science and Art at Edinburgh the other day the great hall was extensively decorated by the Lawson Nursery and Seed Company, on the ground floor of which they had fitted up a most beautiful and tasteful conservatory.

NOTES AND QUESTIONS.

[THE following notes and questions came to hand, or were answered too late for insertion in their several departments.]

Tacsonia sanguinea.—Allow me to thank "J. M." for his correction in respect to this *Tacsonia*. I inadvertently placed it in the first division of climbers for a cool house, instead of in the third or stove section, where it ought to have been.—T. BAINES.

Masdevallia attenuata.—This is not a showy Orchid, inasmuch as plant, flowers, and all might easily be put into an ordinary match box. It has bright green spatulate foliage and solitary snow-white flowers, with buff-coloured tails characteristic of this genus. It is now flowering freely in the Orchid-house at Kew.

Culverwell's Prolific Marrow Pea.—I can recommend this as a Pea for everyday use, particularly to those who have a large supply to furnish from a limited space. It is just the Pea to take the place of the Champion of England. Mr. Culverwell uses it not only as a late Pea, but as a Pea for everyday use. It is, in fact, a giant Veitch's Perfection.—THOS. KEETLEY, *The Gardens, Newton House.*

Raising Yuccas from Seed.—What is the best and surest way of germinating *Yucca* seed, the most suitable soil, and is bottom-heat required?—HOY. [The seeds of *Yucca* should be sown in a peaty soil, in pots half filled with broken bricks or potsherds, and placed in a temperature varying from 55° to 60°. They do not require bottom-heat.]

Orobanche on Primula.—On the 5th inst. I removed an *Orobanche* minor from the root of a plant of *Primula sinensis fimbriata alba*; the parasite was in bud, having been forced with the *Primula*. The seed, no doubt, came from some road-scrappings, the plant often occurring on Clover by the road-side. The seeds, however generally remain in the ground until they meet with a suitable nidus—that is, a leguminous plant, *Galium mollugo*, *Rubus fruticosus*, *Centaurea*, *Achillea*, *Cannabis*, or Ivy. It has not, I believe, before been recorded on a *Primula*.—G. S. BOULGER.

The Best Nectarines.—In his list of Nectarines (see p. 524), Mr. Fish seems to have over-looked Lord Napier and Duc de Telliers, both excellent Nectarines, which I have found to be the best bearers in cultivation. Lord Napier bears well, even in a young state, and its fruit is of the very largest size. Except Lord Napier, Pitmaston Orange (a really good Nectarine), Violette Hâtive, and that excellent variety, Duc de Telliers, all others produced with me this season but a fruit or two each; even the Elruge failed. Lord Napier and Telliers are much superior to Hardwicke Seedling and Balgowan.—JOHN TAYLOR, *Hardwicke Grange.*

Conifers for Swampy Ground.—I would recommend your correspondent "Salmoniceps" (see p. 42) to plant the following in his swampy ground, viz:—*Juniperus vulgaris* (communis), and its varieties, *J. hibernica* and *Suecica*, *J. Sabiniana*, *Tamariscifolia*, *J. tripartita*, *virginiana*, and its varieties, *Camæcyparis sphaeroidea* and its varieties, *Taxodium distichum*, *Thuja occidentalis*. Besides these, the following do very well in rather wet but well-drained ground, viz.:—*Abies canadensis*, *Cupressus Goveniana* and *Lawsoniana*, *Picea grandis*, *Pinus austriaca*, *maritima* (*Halepensis*), and *tuberculata*, *Retinospora ericoides*, *leptoclada*, and *squarrosa*, *Sequoia sempervirens*, and *Widdringtonia cupressoides*.—WILLIAM BARRON, *Elvaston Nurseries, Borrowash.*

Hepaticas under Glass.—The best plant I know of for winter blooming in a cold greenhouse is the common blue Hepatica. Last spring I potted a large plant of it, which I took into my greenhouse about ten days ago and it is now one mass of lovely blue flowers. There are two great advantages in forcing the Hepatica: the buds, though apparently dormant, will open almost while you wait, so that you may have your plant in full bloom at an exact date; secondly, under glass you may obtain any amount of seed, and, as the pollen ripens, cross the varieties well together. I mean to try *Hepatica angulosa*, the loveliest of the section, next year. Hepatica seed should be sown in a sheltered spot in fine soil; it takes a long time to come up, but plants thus obtained bloom better than any others. I have seen a large bed of two-year old plants that were quite superb.—F. MILES.

Raising Seedling Geraniums.—I sow hybrid Geranium seed directly it is ripe, leaving the feather end sticking out. Some seeds come up at once, and some are coming up now—two months, at least, after being sown. Two years ago I tried to raise a good white-flowered white-edged Geranium, and saved a seedling with a white edge that had been raised from Madame Vaucher. This edge disappeared in the spring, and the whole plant merged into a fine bronze, somewhat like Egyptian Queen. Towards the end of the summer the leaves became quite green, and now it is nothing more than an ordinary salmon-eyed Zonal. The lovely Zonal Geranium, Rose Peach, was raised by Mr. Pearson from Violet Hill. Seedlings from Rose Peach are frequently variegated; and I have also got a finely variegated sport from that Geranium. Now, Violet Hill, the parent, I have never seen variegated; and though it is one of the very best bedding Geraniums in point of colour and flower, it was raised by Messrs. Henderson for a Tricolor. So this variegation has passed through, but never appeared in, Violet Hill, and now comes out in Rose Peach.—M.

The Blue Vanda.—I am much pleased with the figure which you have given of our blue Vanda (see p. 43), which has been in Mr. Lane's possession twenty years. It came from the Botanic Gardens, Glasgow, and was a very small plant in a small 60-sized pot. In 1867, when it first came under my care, it had a long bare stem. Six years ago it pushed some fresh roots from amongst the lowest leaves; the following spring I cut it off just below the fresh roots, put it in a much smaller basket, and plunged it in a hotbed. It soon began to grow, and in a short time it was removed to the stove, where it stands on a front stage of slate, with hot-water pipes underneath. The top of the plant is about 18 inches from the glass. The compost in which it is planted consists of lumps of good rough peat and equal parts of crocks and charcoal. About March I begin to water it overhead, and continue to do so till the flower-spikes show themselves, and then I cut off the supply. When the flowers begin to fade, I gradually withhold water, which is then given about, say, once a week. I never let the soil become quite dry. When this Vanda is growing it likes abundance of water and plenty of air. I ought to mention that for three months my stove temperature falls as low as 50° at night, and sometimes lower than that; in fact, it is rather an intermediate-house than a stove. Mr. Lane tells me that this Vanda never flowered so well as it has done these last five years.—W. SMITH, *Badgemore, Henley-on-Thames.*

Ragley Hall.—In our account of the places laid out by Mr. Marnock, this was printed Hagley, instead of Ragley. They are, however, two totally different places. At the former (Lord Hertford's) Mr. Marnock carried out work; at the latter (Lord Lyttelton's) he never did.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

A PLEA FOR FRUITS AND VEGETABLES.

WHEN the Canon Sedillo was ill he sent for Dr. Sangrado, who was considered, in Valladolid, as a second Hippocrates. His faithful biographer describes him as a man of solemn appearance, deliberate in his discourse, and mathematical in his reasoning. He was a tall thin person, and had kept the shears of destiny employed during forty years at least. "Pray, what is your ordinary diet?" was his first question. "My usual food," replied the Canon, "is broth and juicy meat." "Broth and juicy meat!" cried the physician, "then I do not wonder at finding you in this condition; such dishes are poisons in disguise, and snares which luxury spreads for mankind in order to ruin them the more effectually. You must renounce all dainty victuals; the most wholesome are those which are the most insipid, for as the blood is so, it requires such aliment as partakes of its own nature. And do you drink wine?" "Yes," said the Canon, "diluted with water." "Oh, that makes no difference," replied Sangrado. "What irregularity is here! Under such a regimen as this, it is a wonder you are not dead long ago. How old are you, pray?" "I am in my sixty-ninth year," replied Sedillo. "Aye," said the physician, "an early old age is always the consequence of intemperance. If you had drunk nothing but water all your life, and had been satisfied with simple food, such as boiled Apples, for example, or Peas and Beans, you would not now be tormented with gout, but would still enjoy the perfect use of your limbs." Without going to such lengths as the sage, it is to be regretted that fruits and vegetables do not form a more important part of our daily meals. It is quite certain that, from early times, we English have been great consumers of animal food. From the days of our warlike ancestors, whose huge barons of beef, and oxen and sheep roasted whole, are described with national pride by their chroniclers, down to a very recent day, when, at our civic and social feasts, it was thought right that the table should "groan" under a load of heavy dishes, we have looked with a pity bordering on contempt upon the delicate dishes which a French Phillis provides for her household. We grow splendid fruit and excellent vegetables—the best in the world—and yet they occupy a very subordinate place at our tables. How seldom, among the substantial viands which compose our breakfast, do we find any of the thousand-and-one excellent dishes which can be made of Tomatoes, Vegetable Marrows, Artichokes, &c.! It is the same at luncheon and dinner; vegetables are too often represented by sodden Greens or ill-cooked Potatoes; while fruit, which ought to form an important part of every meal, is merely used as a dessert. Who can properly appreciate the delicate flavour of a Strawberry or Greengage after a heavy repast composed of three or four courses? I should like luncheons which consist, for example, of a light vegetable soup, followed by a compôte of Raspberries, Gooseberries, Apples, or any fruit in season, with cream and bread, to be the rule instead of the exception. As it is, in the houses of the middle classes the greatest monotony prevails. Where there might be a number of wholesome and inexpensive dainties, their meals are generally heavy and unvaried. As regards the working people of this civilised country, their cooking is, as a rule, as bad as it can possibly be. With the exception of those who have been cooks in affluent families, their wives are unacquainted with the first rudiments of the art. Where they might have, at a small cost, capital vegetable soups, good fruit puddings, and jams, with Potatoes cooked in many different ways, they are too often satisfied with the latter succulent, sodden and watery, as an accompaniment to the black and juiceless chop, or the red herring, which is such a standing dish with the poor of our towns. Of the composition of good soups or broths they know literally nothing, though they gratefully accept soup as a gift from some considerate and more intelligent neighbour. In Scotland, plain

cooking is far better understood, and I have many times dined sumptuously at humble tables on hodge-podge and barley broth—a couple of excellent dishes. When we turn to France, who cannot remember the good repasts (not to speak of Paris, and the Trois Frères, or the Maison Dorée) at wayside inns, where "Carottes à la Maître d'Hôtel," or "Haricots Verts" formed the staple, and the meat occupied but a secondary place? Then, an excellent dessert, not always composed of the "Quatres Mendiants" (Almonds, Raisins, Nuts, and Figs), crowned the whole. In Germany, vegetables are not so well cooked (though they are grown in great abundance), and the fruits there are of inferior quality; still excellent dishes are composed of both. The compôtes of Apples, Pears, and Cherries, and some of the vegetable preparations are not excelled by anything in England. No Englishman, it is true, could be found to tolerate Sauer-Kraut; but this may be merely prejudice. In Denmark (though rather behind in culinary matters) a favourite and delicious dish is Rød-grød. It is simply fruit of any or various kinds, stewed until quite tender, and passed through a sieve, then mixed with boiled Semolina, or Rice-flour, and sugar, and eaten with cream and bread. In Italy, the poorer classes live almost entirely on vegetables, fruits, and Maccaroni. Chestnuts form the staple food of the labourers in some parts. Tolerable bread is made of them, and they may be cooked in many different ways. In Tuscany, a soup made of bread and Beans is a sort of national dish. The labourers cannot afford to eat much animal food. They boil their meat first for soup, and serve it up afterwards in a kind of stew with Potatoes, Carrots, and Turnips. This is called "Lesso." Indian Corn is extensively used; they make of it Polenta (a kind of mash), which is both good and wholesome. Thus, the Italian peasant, though poorer than our English labourer, has a pleasant variety in his meals, to which his northern brother is a stranger. No doubt the short winters and sunny climates of Italy render animal food less necessary. I was nearly forgetting Spain, but there the art of cookery is nearly as backward as everything else. Nature has been bountiful indeed to this ill-starred country, but her gifts are not turned to the best advantage. When the traveller from this island of fog and mist finds himself in a Spanish market, he is dazzled and delighted with everything which meets his eye. The costumes of buyers and sellers—the graceful mantilla shading the olive cheek of beauty—the brilliant colours of the peasants' dresses, richly ornamented in some parts of Spain with gold and silver coins, the enormous red umbrellas, the clatter of fans, mingling with the ceaseless splash of the fountains in the middle of the market-place, the piles of fruit and vegetables, green and golden Melons, purple Grapes, Pomegranates and Peaches, the huge bouquets of Roses and Lilies, mixed with other flowers which grow luxuriantly in that sunny climate—all these form a picture, which, when once seen, can never be forgotten. But the people themselves make but a poor use of their advantages. Though Spain is the country where the Olive flourishes best the oil is very inferior, and it frequently gives an unpleasant taste to the dishes, in the preparation of which it is lavishly used. Cabbages and Beans are the principal vegetables, if we except Lettuces and salad herbs. The splendid fruits I have described are seldom cooked in a manner to tempt a fastidious palate, but one hardly misses this because they are in such perfection that a good meal may be made of them in the raw state, with the addition of bread and chocolate. I must not forget burnt Almonds, without which no Spanish dessert is complete. To return to England: I often wish that every cottage had a garden, where fruit and vegetables could be grown, where the good housewife, like Chaucer's Grisilde, could gather the

Wortes and other herbs times oft,
The which she shrede and sethe for her living.

The principal object of village horticultural societies should be to spread the knowledge of gardening, and to encourage amateurs and small cultivators to grow the best kinds of fruit and vegetables. It appears to me that a great reform is wanted here, but I have travelled a long way from my starting point, and must reserve what I have to say on this head for a future paper.

NOTES OF THE WEEK.

— THE rare and chaste *Cattleya Bogotensis* is now in flower in Mr. Michael's collection, at Highgate. The flowers measure fully 6 inches in diameter; sepals and petals crisped, and of the purest translucent white, the petals being 3 inches long by 2 inches broad; the lip is also white, and beautifully stained in the interior with lemon-yellow.

— LAST week's Potato imports into London amounted to 1,160 tons and 3,691 sacks from Dunkirk, 12,617 bags from Antwerp, 576 sacks from Ghent, 169 tons from St. Brieux, 992 sacks from Boulogne, 171 tons from Calais.

— SOME idea of the loftiness attained by trees of the genus *Eucalyptus* may be formed when it is stated that some of the specimens of the *E. amygdalina*, measured by Baron von Müller, the Government Botanist of Victoria, would overtop the cross on St. Paul's Cathedral.

— THREE new species of *Eranthemum*, recently received at Kew, are remarkable for the beauty and brilliant colouring of their foliage. None of them have yet flowered, and they only bear the provisional names given them by Messrs. Veitch, who obtained them from the South Pacific Islands.

— THE annual meeting of the Royal Horticultural Society is fixed to take place on February the 9th.

— WE are glad to hear that Mr. T. Bruges Flower, F.L.S., of Bath, has just finished the concluding number of his "Flora of Wiltshire," containing the Grasses and Ferns, which has been published by the Wiltshire Archaeological and Natural History Society, in their magazine. It is hoped that it will be found practicable to republish the whole of this excellent Flora in a single volume.

— THE "Revue des deux Mondes" of 31st January contains an interesting paper by M. Planchon, on *Eucalyptus globulus*. The subject is treated from the botanical, economical, and medical points of view. The *Eucalyptus* is known to combine an iron texture with rapidity of growth. Some estimates have lately been made with reference to its value as a forest tree in Algeria. According to M. Cordier, if 1,000 of the trees were planted closely together, there might be cut down in 5 years, 500 of them worth 600 frs.; in 10 years 250, worth 1,323 frs.; in 15 years 125, worth 1,473 frs.; in 20 years 60, worth 1,521 frs.; and in 26 years 60, worth 3,195 frs.

— THE plants figured in the "Illustration Horticole" for the three months ending 1874 are—*Sciadocalyx Luciani*, a pretty Gesnerad raised between the Foxglove-flowered *Sciadocalyx* and *Tydaea pardina*; *Theophrasta imperialis*, a well-known species; *Camellia Miss Minnie Merritt*, a variety in the way of Jubilee; *Fourcroya Lindeni*, a pretty kind with yellow-bordered leaves; *Dracæna Troubetzkoi*, a species from the Melanesian Islands, intermediate between *D. Regina* and *albicans*; *Clavija Rodekiana*, a *Theophrasta*-like plant, and a valuable addition to the genus to which it belongs; *Spathiphyllum heliconiæfolium*, a beautiful Aroid from the banks of the Rio-Huallaga, in Peru; *Dracæna densicoma*, a green-leaved kind, which produces great pendent spikes of creamy inflorescence; and *Kentia Balmoreana*, a handsome Palm discovered on Lord Howe's Islands by Mr. Moore, of Sydney.

— WE have received, from Professor Sargent, a report respecting the present condition of the Arnold Arboretum, presented to the President and Fellows of Harvard University, which shows that, in spite of limited means, satisfactory progress has been made in the two years during which Mr. Sargent has been entrusted with its formation. The soil and indigenous growth on the various portions of the grounds have been carefully studied with a view to a proper determination of the permanent disposition of the various collections, and several thousand trees and shrubs have been raised for the future plantations. An inspection of the trees already growing in the Arboretum showed that many of them were in a miserable condition from long neglect of proper thinning, and the consequent want of food, light, and air. To remedy this as far as possible the woods and old plantations have been gradually thinned out, the weak, deformed, and unhealthy plants being cut first, and then such as interfered with fine single specimens, or with specimens of only occasional occurrence. Returning health in many of the trees, and a greatly improved appearance of the woods and belts of timber, are already apparent, although the operation of thinning out old woodlands, with a view to forming healthy, well developed trees is necessarily a slow one, and must be extended over many years. Already many noble specimens of some of the finest native trees are scattered through the open portions of the grounds, giving to the arboretum a furnished appearance, and proving that the situation is particularly adapted to the use to which it is to be devoted. A catalogue of the trees growing in the arboretum is subjoined to the report.

CHERRY CULTURE ON WALLS.

It is often desirable to grow the Cherry on walls, not only with the object of having early fruit, but also of prolonging the supply, and this may be done by taking the first crop from a south or west wall, and the latest off a north wall. Considering the prolific habit of the Cherry under proper treatment, it is well worthy of a wall, for few fruits are more refreshing or agreeable when perfectly ripe—as a Cherry should be before it is eaten. It is only those, however, who grow their own fruit that can have it in this condition, for the Cherries of the shop are generally gathered too early, the growers being eager to push their stock into the market as soon as possible. The Cherry comes early into bearing if it is well trained and the knife is used sparingly in pruning; but damage is often done in this way to the trees, especially where no skilled gardener is employed, or where the jobbing hand is called in to do the pruning, and often where the proprietor himself, under the impression that pruning of some kind must be performed, sets about the task without a very clear notion of what is required. Perhaps I cannot better give an idea of how to proceed with young trees against a wall than by describing my own practice here, and its results. Ten years ago I had to deal with a west wall of young trees, which had been planted about three years. I found they had been pruned hard back annually, and, being in a strong soil, they had simply pushed out gross wood every year, without showing the faintest signs of fruit. As I found these in an unpruned condition, I proceeded to have all the most awkwardly-placed shoots cut clean out, and as many of those remaining as could be accommodated without crowding laid in their entire length, so that I at once secured fine little fan-shaped trees several feet in diameter. I also root-pruned them slightly at the time, but I have not had occasion to repeat the operation since, the laying in of the young wood entire, or nearly so, and summer pinching, rendering it unnecessary. The following season the young shoots flowered freely and bore their first crops. During the summer the breast wood was pinched regularly, a work of little time, the leading shoots were laid in as they grew, and additional young limbs led off from the upper sides of the old ones, as the spaces between these widened with the extended radius. In this way the vigour of the tree was expended uniformly in the production of bearing wood. In winter no pruning was necessary, except the shortening of the spurs here and there where the foreright shoots had been pinched. All the time, of course, the previous year's wood—that which bore the fruit—was forming natural spurs and buds for future crops; for it must be borne in mind, that the Cherry bears freely upon both the previous year's wood and the old wood, the latter furnishing bearing spurs, which yearly increase in size and bear, in fact, the most fruit. By the third year the trees had extended themselves so much that it was found necessary to remove every alternate one, and since then they have again met and filled the space allotted to them, or nearly so. The only circumstance to be regretted is, that eventually they will not have as much room as they would require. There is nothing more inimical to the welfare of a stone-fruit tree than a restricted development of the branches. There cannot be the least doubt that a free extension is the surest guarantee of fertility. It is astonishing what an area a Peach, Plum, or Cherry tree will cover in a few years, without the least danger of the trees getting scant of bearing wood at the bottom; yet an excuse is often offered for the mutilating process, but one that is invalidated by the facts of the case, for no trees break and furnish so freely as those mentioned, no matter how long the shoots may be. If allowed, an ordinarily vigorous Peach tree, for instance, will, by its powers of extension, cover 600 square feet in eight or ten years, and ought to bear a proportionate quantity of fruit. The Cherry trees in question continue to bear every year profusely, on every branch, from its furthest extremity down to the bole, within a foot of the ground. We never disturb the roots. The border is planted with Gooseberries, and these are manured occasionally. Sometimes only a mulching is applied, which is particularly beneficial to the Cherries in dry weather. The Cherry will keep well on the tree after it is quite ripe if a mat be hung over the tree. In this way we have kept early Cherries till nearly the end of August, thus prolonging the supply from June. J. S. W.

THE FRUIT GARDEN.

GRAFTED GOURDS.

At the last exhibition of the Central Society of Horticulture in France, the public had an opportunity of inspecting the magnificent collection of Cucurbitaceous plants shown by M. Gaillard, and were much struck by specimens of fruit of different forms and colours,



Yellow Gourd, into which the stem of a Green Pear-shaped Gourd has been introduced, the latter having a portion cut off and replaced by a part of a White Gourd.

which, though united, belonged to different kinds. This was the result of grafting; and, although such unions naturally appear extraordinary to people unacquainted with the art of grafting, yet those who are familiar with vegetable physiology are aware that, under certain conditions, a portion cut off one fruit and placed on another will unite firmly and grow. One condition is indispensable, viz., the fruit must be of an analogous character, and belong to the same family. Another precaution that must be taken is to raise the



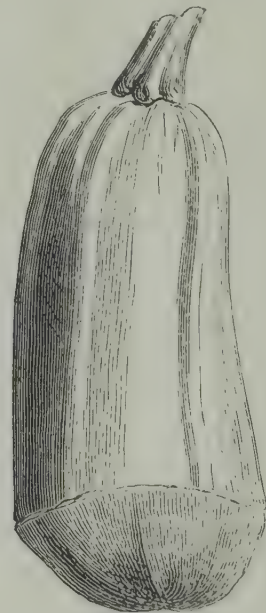
Spanish Gourd, on which an Elector's Cap Gourd has been grafted.

epidermis, or the skin of the fruit to be united, so as to bring the cellular tissue, in course of formation, into contact; for, unless this is done, no lasting union can take place. The first of the accompanying illustrations represents a yellow Gourd, into which has been introduced the stalk of a green Pear-shaped Gourd, from which a large slice has been cut off and replaced by a corresponding

section of a white Gourd. In this case a perfect union has been effected. The second illustration represents an Elector's Cap grafted upon a green Spanish Gourd. In this case it was sufficient to partly peel the Gourd and make an incision into the tissue so as to form, as it were, a socket for the Cap, which was also peeled so as to expose a portion of the cellular tissue. The third illustration represents a Virginian Gourd, the extremity of which has been cut off and a portion of the interior scooped out in order to obtain the seed. This having been accomplished, the two parts were again drawn together with a thread, but in such a manner that they did not fit exactly. In spite of this, however, a union was thoroughly effected. The facility (says the "Revue Horticole," from which this account is translated), with which Cucurbitaceous plants will unite under the circumstances just described is most likely due to a gummy resinous principle, which is found in the tissues of the stalks and the fruit of these plants, and which assists adhesion in the first place, and then the more perfect junction of the two surfaces.

RAISING VINES FROM EYES IN TURF.

MR. MUIR (see p. 80) states that raising Vine eyes in turf originated at Dalkeith many years ago, and goes on to describe the system of raising the eyes on 6-inch square pieces of turf, exactly as recommended by me at different times and practised since 1867, and now practised in many places. I would much rather have avoided raising the discussion now, but, trifling as the matter is, I think such an unauthorised statement should not pass unchallenged. In the first place, then, I would say that, personally, Mr. Muir must be unacquainted with what took place at Dalkeith at the time he states, for he never was there, and he is clearly not read up in the



Virginian Gourd, of which the end has been cut off, and, after the seed was extracted, replaced.

matter. Secondly, during the eight years I was at Dalkeith I saw every Vinery on the place planted but one, which was renovated, and not a single eye was raised on turf for any purpose, but in small pots as Mr. Thomson describes in his book on the Vine, though Mr. Thomson planted one-year-old Vines on turves and in baskets, and also Vines from eyes after they had been raised in pots and were about 18 inches high. Thirdly, I began the turf system with the first Vinery I planted after I came to Wortley, at the end of 1864, and Mr. Thomson began his turf practice in 1870, with the Vines for planting at Clovenfords; and, during the incidental discussion that was raised then on the subject by others than myself. Mr. Thomson stated that his practice and mine had no points "in common," except that we both used turf—he a bed of turf 4 inches deep, and I 6-inch square sods, which I moved about according to circumstances, just the plan Mr. Muir now adopts, and recommends to your readers in the calendar for this week. I hope, therefore, your correspondent will see fit to retract statements, which, to say the least, he has made without taking the trouble to discover whether they were correct or not. It is not a question of spreading the roots of pot-raised Vines on turves or trays, but raising the eyes on turves from the beginning, in order that no check may be experienced, as is apt to be the case when they are raised in pots, and afterwards transferred to the turves. The use of scoops or baskets for young Vines that have to be moved, is not new, for French Vine growers have adopted this plan from time immemorial in transferring layered plants from the parent

plant to the border. The flat turf trays are a decided improvement in this respect, but the principle is the same—the object in both cases being to avoid disturbing the roots in planting. J. SIMPSON.
Wortley.

THE GRAPE VINE.

Preparing Permanent Vines for Early Forcing.

FOR very early forcing it is much better and more economical to employ pot Vines, as these can be pushed harder than is desirable with permanent Vines under similar circumstances, and a greater crop can be got from a given area. Still, in some places, where there are many Vineries, one house can often be afforded for early work; and it is here necessary to point out the conditions to be observed in such a case. Vines that are forced early for a number of years get weaker and weaker every season, as might be expected, seeing that growth is produced at the most unfavourable period of the year, and under very artificial and adverse circumstances. It is most desirable, therefore, that Vines intended for such work should be thoroughly established and in good health and vigour to begin with. This point is too often lost sight of, however, in the desire to hurry the Vines into early action. The “working round” process is begun almost before the Vines are more than half grown, and the consequence is, that by the time they are fit to start in November for a first early crop, they are already enfeebled and quite unfit for more than a few years duty, and have to be either rooted out and replaced, or let back for a few years to recruit themselves. Under these circumstances, therefore, it is not advisable to force other than aged Vines that are in good health and that have not previously been started before the natural season. One month or six weeks is as great a leap as should be attempted in one year; and, assuming that the Vines have been previously started about the 1st of March, the middle of January or beginning of February, will be soon enough the first year. The second year they may be started about the middle of December, and the third they will be fit to start in November, about as early as it is ever found desirable to start Black Hamburgs for an early crop, and not often needful in these days when late Grapes can be kept till the beginning of summer. The directions already given for culture during the growing period, and pruning, &c., are also applicable to early forced Vines, only that more discretion in the matter of airing and temperature, and care generally, is required. The ability of the Vines to stand hard forcing for a number of years in succession depends greatly upon intelligent practice in these matters. The object should be to dispense with artificial heat as much as possible, and husband the sun heat on all favourable occasions. Air should be admitted constantly by the hot air ventilators, and by the back and front shutters whenever possible, if only through a chink; but avoid draughts; and damping must be reduced to a minimum while neutralising the scorching effects of hot pipes by keeping the border in a properly moist state. As regards bottom-heat, watering, &c., the reader is referred to my remarks on that head.

Inarching.

Inarching and budding are resorted to when it is desired to increase the varieties in a Vinery without planting (or employ particular stocks) which is inconvenient, and often attended with poor success in a border that has been made for some years. These two practices, especially the first, have quite superseded grafting with Vines, being both simple and almost certain to be attended with success. I prefer inarching in all cases; but budding is also a sure way of getting a strong cane, and even fruit, the first year, as the buds attached bear just like the natural buds of the Vines—according to Mr. Stevens, of Trentham, who has practised budding frequently with great success. Inarching is best performed upon the young growing wood, while it is still green, but when the tissues are just beginning to harden. It is performed by simply bringing the stock and scion together, and taking a slice of each, with a sharp knife, about 2 inches in length and of equal breadth, where the junction is to be effected, and bringing the two together so that the edges of both meet exactly, when they are secured above and below the union with a tie of matting, and afterwards bound tightly together with soft matting the entire

length of the cut. No further wrapping is necessary. The stock may be stopped four or five joints above the union, but the point of the scion must be encouraged to grow. A complete union will generally be effected in about a fortnight, or less if the Vines are growing vigorously, but it will be necessary to examine the shoot frequently during that time to see if the matting is not cutting into the bark as the growth progresses. When the union is complete, the bandage should be removed entirely, and the stock cut clean off just above the junction, so as to direct the current of sap into the scion alone. Young Vines so inarched upon old stocks, as a rule, make vigorous canes the same season.

Budding.

This operation is performed in two or three ways; but Mr. Stevens' plan seems to be the simplest and most successful, judging from the canes I have seen. Budding is performed on the ripe wood about the end of August or beginning of September. A slice of bark, equal in size to the bud to be attached, is cut off the Vine to be budded, at the desired place; the bud is then sliced off, with a small portion of the wood and bark adhering, and placed on the seat prepared for it on the stock, slipping the lower end of the bud into a small slit in the bark, to keep it in its place. It should then be bandaged securely with matting, and protected with fine Moss to keep it moist until it has taken. Budding may be very advantageously performed on old bare Vines that have not broken regularly, so as to furnish them with spurs in a regular manner.

J. S.

(To be continued.)

POTTING PINES.

THE potting of Pines should always be done with care, although it is far from being the most important operation connected with their cultivation. In many instances there is a great deal of unnecessary labour expended in such work. For example, it is a very common method to ram the soil about the plants with a piece of wood as firmly as it can be beaten, and I have never been able to see the advantage of this; for, after contrasting plants thus treated with others that were potted, by pressing the soil about the roots with the hand, like any ordinary plant, I have come to the conclusion that the practice should be dispensed with, although it dates back to the introduction of artificial Pine growing. With what object it was originally adopted, I cannot say; but I am convinced that those who still persist in the practice, do so because the attempt has never been made to do without the “pin” while potting. Some of the finest stocks of Pines in the country have been grown without it. The only pressure to which the soil used was ever subjected, was to give the pot a good shake after the plant and soil were placed in it, to settle the latter about the roots, and finish off by giving the whole a couple of firm knocks on the potting bench. The soil was not heavy and clayey, or less firming would have been needed, but somewhat light and well filled with fibre, as all Pine soil should be. I do not mean that the plants should be placed in the pots so loosely that they may be swayed to and fro with the hand; but the soil can be filled in with sufficient firmness without ramming. I have sometimes heard it contended that firm potting saved frequent watering with many kinds of plants; but I do not consider it beneficial to any kind of plant (except aquatics) to have the soil so stiff and retentive about the roots as to render watering unnecessary, when the plant in its natural state would require it. Plants are not alike in their requirements of water. These, in some, are regulated by the rapidity of their growth; in others, by the texture of the leaves and the temperature in which they are grown; but it is always a good healthy sign when a plant, of whatever kind, takes water freely. The most judicious mode of potting Pines is to have the soil and pots ready before disturbing the plants. The pots, if not new, must be clean and dry inside. Large bits of crock should be laid at the bottom, with smaller pieces on the top to the depth of 2 inches, and a layer of Moss over all, to prevent the soil from passing through and obstructing the drainage. The soil should consist of pure fibrous loam, to every barrow load of which should be added an 8-inch potful of finely-ground bones. This, well mixed, is superior, for Pines, to any other manure. The soil should be heated to 60°, and should not be so dry as to crumble into dust when worked between the fingers, or so wet as to stick to them. When preparations have reached this stage the plants may be brought forward. Sometimes the leaves are not tied up when potting, for fear of putting any of them out of their growing form; but there is always less risk of damage when they are gathered carefully together and tied neatly up with a piece

of strong matting, before taking them from the bed in which they have been growing. Small suckers, less than 1 foot high, should be placed in threes in a 6-inch pot, in a triangular position. The suckers should be pushed into the soil, which should be pressed well in with the finger and thumb, so as to leave an inch between the surface and the rim of the pot for water when needed. The bottom of the sucker should be placed midway between the surface and the drainage, so as to admit of rooting both upwards and downwards. The soil for these should not be rougher than will pass through an inch sieve. When the large plants are turned out of their pots, the old crocks must first be cleared away. The quantity of soil to be removed will depend on the state of the soil and roots. It is always safe to rub off all soil in which there are no roots; and, if the soil be the least sour or sodden amongst them, it must be taken out also, as the outside roots will not remain healthy if they have first to pass through bad soil. The smallest of the leaves round the neck should be carefully abstracted for an inch or two up the stem; when this is done, many small roots appear ready to start into the soil when placed in contact with it. It is not safe to clear the leaves further up the stem than where the pale brown colour ceases, which is found on all hardened stems. When placed in the pot the soil should cover the bare stem, or the benefit which they otherwise gain through the operation is lost. If the old ball is large and entire, the finest of the soil should be worked down the side of it.

J. MUIR.

GRAFTING TO TEST NEW VARIETIES.

EVERY fruit-grower should experiment constantly in the way of grafting, and thus prove for himself the value of different varieties of fruits. In his visits among his neighbours, whenever a good fruit is brought to his notice, he should at once procure a few scions, and wrap them up in moistened paper until he reaches home, when they should be consigned to a box in his cellar; this box should contain damp Moss or saw-dust, and should be placed in a cool, moist corner, away from a furnace. In consigning the scions to this receptacle, great care must be taken that they are carefully covered all round with the Moss or saw-dust, to keep them from coming in contact with the air. Some kinds of fruits, such as Apples and Pears, graft much more readily than others. Stone fruits, such as Cherries, Peaches, and Plums, can be reproduced more satisfactorily by means of budding. The uninitiated in these matters should, therefore, turn their attention more particularly to the first, and after they have gained proficiency it will be time enough to try their hand at the latter. In testing new varieties, it is much more sensible to own a single limb on an old-established tree, than to purchase a young plant, and wait for several years to ascertain perhaps, after all one's trouble, that it is not at all suited to the locality. The largest limbs may be marked quite easily, by merely making a downward cut through the bark, for, say, an inch in length, having previously cut off the branch squarely and smoothly. The graft should not be cut wedge-shaped as in the customary cleft-graft system, but the cut must be all on one side, and inserted between the bark and wood of the limb, beneath the slit aforesaid. After tying it into place firmly, apply a good coating of grafting-wax or clay, and the operation is complete. Several grafts may thus be inserted round a large-sized limb, and these after "taking" will soon grow over and completely cover the end, so as to make a neat appearance afterwards. Occasionally, when we have a large number of varieties on one tree, the stronger kinds will smother the weaker, if care be not taken to keep the former within bounds; and yet there are instances where as many as twenty and even thirty distinct varieties of Apples are growing on one tree, all in bearing condition, and the owners sweep away the premiums for the best and largest displays at every show where they exhibit. Old Pear trees, whose usefulness has passed away, may be made to produce bountiful crops of delicious fruit once more, by grafting over their tops with good kinds; indeed, there are plenty of such instances existing, to prove how very valuable grafting is, where good healthy stocks already exist.—JOSIAH HOOPES in "Tribune."

MILDEW ON VINES.

A DAMP stagnant atmosphere favours the development of mildew, which often attacks Vines in all stages of growth. Sometimes it appears on the first leaves that expand from the eye before the wood attached to it is well rooted. On Vines planted out, it appears on the wood, on the foliage, and on the berries. It generally seizes on the leaves first, and looks like a small speck of mould, similar to that which appears on decayed fruit. These specks very soon multiply in number and increase in size, until the entire leaf is speckled. Before the disease has reached this stage, the berries are

generally affected as well, and in much the same way. It may be rubbed off them with the hand, but not before the damage is done. The part soon shows signs of a small brown spot, and decays. When mildew extends to the wood, it remains on it until it is matured, and when ripened brown the spots of a dark colour are still visible upon the affected parts. Abundance of fresh dry warm air will stay the progress of, but not eradicate the disease. Liberal dustings with flowers of sulphur are the most effectual remedy, and, if applied in time, will save all. Machines are manufactured for distributing sulphur, and they do their work efficiently. Those who have not got them, may use a flower pot with a piece of thin gauze cloth tied over the mouth. On young Vines every leaf should be dusted all over every third day until the mildew has altogether disappeared. Other Vines must be treated in a similar way. Bunches affected should have the sulphur well shaken through them. As soon as there is a certainty of its being overcome, the sulphur should all be syringed from the leaves and fruit with clean water. Traces of it generally remain, however, and any Vines affected during the time of their growth should be well washed, and afterwards painted with sulphur, when the pruning and cleaning is done. If care, in this respect, be not taken, it may appear again next season, when the Vines are started into growth, and the consequences may then be more serious. If young Vines are propagated from wood which has been affected with mildew, it appears on them immediately they begin to grow; so that a good deal of caution is necessary wherever its presence is suspected.

J. M.

Small Apples the Best.—As Apples remarkable for size receive at the best public exhibitions the largest share of attention, it may not be amiss to say a word in favour of the varieties which produce fruit small in size, but of exquisite flavour. Let us take, for example, that well-known little Apple, Sam Young, which at this season of the year is a "real gem." Then, again, there is the Margil, Pitmaston Pine, and Powell's Russet, all of which are small, of the highest quality, and keep well. Indeed, I question whether there is another four to match, for late use, these three and Sam Young. Just before the fruit show held at South Kensington in November last, I made up my mind to show a collection of little Apples, and had samples of a large number of varieties selected. They were a lot of "little beauties," but, on looking them over, the thought struck me, "what use is there in sending these gems, the merit of which have small chance of being recognised by the judges?" Therefore, after turning the matter over in my mind, I determined not to send them, and subsequent events proved that I was right, for in the competitive classes the largest fruit was invariably placed first, and in some of the classes provided for specified varieties large and coarse examples were put before others well finished, although only a size or so smaller. I am not, mind you, complaining of the judging on that occasion, but simply mentioning a fact to show that it is no of use to exhibit these small kinds, although they are invaluable for the dessert.—JOHN SCOTT, in "Gardeners' Magazine."

Vicar of Winkfield Pear.—This Pear had high commendation from several cultivators, at the great Boston pomological meeting, as a good and very profitable sort, when properly managed. It usually over-bears; but when two-thirds of the fruit is picked off early in the season, and it is left on the tree till the frost comes, it is greatly increased in size, colour and quality, and becomes a good eating Pear. A member from Connecticut stated that he had thus grown them weighing 16 oz. Haskell, of Massachusetts, said the best Pears he ever ate in February were of this sort, large, with a blush. Coit, of Connecticut, had fine cooking Pears in March, when thinned to one-quarter. Earle, of Illinois, said it had grown in favour with him since he had thinned it; but in most localities in the West it had failed from the blight.—"Cultivator."

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Soil for Vine Borders: ALPHA. No exact proportion of materials for making Vine borders can safely be given, as so much depends upon the quality of the materials to be used. The more clayey the loam, the more brick rubbish, or the like, is required to give porosity; and the richer the loam, the less bones or other fertilising agent is required. If, to three parts of your sandy loam, you add one part of lime rubbish, and to every cubic yard half a bushel crushed bones you will probably secure a good result.

Budding with Gooseberries and Currants.—In the "Revue Horticole," M. Carrière describes a way of budding Gooseberries practised by MM. Croux, of Sceaux. Among other experiments of this nature, MM. Croux have trained a number of plants of Ribes palmata to a single stem, and budded the stock with Gooseberries and Currants of various colours and forms. The result, as may be imagined, has been both curious and ornamental. So complete was the natural conformity between the stock and the graft that it was hardly possible to tell the spot where the latter had been placed.

VENTILATION OF HOTHOUSES.

It was with considerable astonishment that I read, in the pages of a contemporary, the other day, the following piece of advice to a correspondent:—"Ventilating hothouses: No; there is no better or other way of opening the sashes than by sliding them down!" This advice was accompanied by suggestions as to how the sliding process might be facilitated by means of three "small castors" on each side of the sash. Had such advice been offered fifty years ago, it perhaps would not have surprised any one; but that there should be any horticulturist still alive who is so benighted as to really suppose that there was "no better or other way" of ventilating than that under notice, is what I could not have believed, had I not evidence before my eyes. It is further suggested, that the sliding up and down of the sashes might be done by "simple machinery." I imagine that it would take a donkey-engine, and about as much gearing as would fit up a coal-shaft, to accomplish the feat in any ordinary range of houses. I never saw ventilation on the sliding-sash principle attempted to be worked by machinery, for the simple reason, I apprehend, that, getting quit of the old cumbrous narrow sash, with its accompanying deep and broad rafters, is a chief object with modern hothouse builders. No greater improvement has taken place in hothouse structures during the last thirty years, than the adoption of the rod and lever, and the continuous shutter, back and front, for ventilating purposes; and none but gardeners who have managed both old and modern houses can realise the immense saving in labour effected in this way. Besides, the system has just set the garden architect at liberty in the matter of design; for he was formerly compelled to adhere to one plan, in order to accommodate the sash with its ropes and pulleys. Now we can have a roof nearly all glass, and plenty of light, whereas, formerly, we had between the sashes about 9 inches of solid woodwork, which cast a shade over the whole interior of the house as soon as the sun passed the meridian. Many, and elaborate, have been the schemes promulgated from time to time to secure the "perfect aëration" of our hothouses. It is not so long since gardeners were amused regularly with the picture of a Vinery—called, I think, the "gardener's house," a fearfully and wonderfully made structure—in which innumerable air currents were represented by a shower of arrows that continually and irresistibly reminded me of the "November meteors;" but it seems to have gone the way of all other such fanciful notions. As far as our fruit-houses are concerned, whether span-roofed or lean-to, I do not see that we want anything superior to the usual top and bottom shutters above referred to. With these, and a coil or two of pipes close to the side openings, as are usually seen now, the most thorough ventilation can be given at any time, and the best results have been accomplished by such means. What more, therefore, do we want? The most elaborate system of ventilation will never enable a novice to grow Grapes, or anything else, better than he did before. Airing is like firing. It matters little what kind of boiler is employed, if some degree of intelligence is not exercised in using the coal-shovel and the damper. Airing is a matter of judgment, and will always be so. The great object of those who have troubled themselves on the subject of ventilation, seems to be the establishment of a free circulation of air throughout the whole structure. This is an important point no doubt, and in very lofty and wide houses, in which plants are placed upon the floor, at points distant from the roof or sides of the house, some special means of carrying the air in amongst them by air drains communicating with the external air, and opening at the desired points inside, if possible, under or near the hot-water pipes, should, and may be provided, in the same simple manner as aëration is effected in some Vineries; but in ordinary-sized lean-to or span-roofed houses, I have never seen the necessity of such provisions for dislodging stagnant air, which cannot possibly accumulate anywhere to a serious extent in such structures, if ventilation at the sides and top of the house is attended to. Distribute the heating apparatus equally over the floor of the house, and you may be sure that the equilibrium will be sufficiently disturbed to prevent air stagnating in any particular part of it. In a Vinery 20 or 30 feet wide, with hot-water pipes at the back, middle, and sides, and shutters at the sides and top of the

house, the merest chink of air at each shutter will sweeten the atmosphere throughout in a few minutes. The air from the top ventilators dashes straight down to the floor, displacing or mingling with the warmer air in its descent, while the front air rushes along the floor until, heated in its progress, it ascends again and escapes at the apex of the roof, and in this way the air in every part is kept moving. In usual practice, there is frequently an unreasonable prejudice against opening the front ventilators. Many practitioners persist in opening the back or top shutters wide, day after day, in sunny weather during spring, and only the merest chink at the front or sides, and all this time with their eyes open to the fact, perhaps, that both in their Vineries and Peach-houses the fruit at the bottom of the rafters is about a month in advance of that at the top of the house—a disparity due entirely to the system of airing. It is surely right to admit air always at the warmest part of the house—in fact, I believe it is this theory, wrongly applied, that has led to the practice of opening the top shutters most. When, however, we see the fruit progressing faster at the bottom than the top of the house, and the foliage broad and thin, we may be quite sure it is there that air in most abundance is required, and adapt our practice accordingly. For years this has been my practice in pits and houses, and I believe I could generally show crops, which, for regularity in ripening over the whole area, is all that could be desired. Perhaps it will be argued that a successional supply of fruit is afforded when the fruit ripens off later at the top. The only reply I can give to this is that the practice is injurious, and it is not good to depend upon an accident for a succession of fruit. The object in all plant structures should be to keep an even temperature throughout; to avoid parching here and chills there; and this, I maintain, is more a matter of experience and attention than anything else. CHEF.

A Small Herb Garden.—There is poesy and savouriness in the very name. There may be likewise order and beauty in it. The most unsatisfactory things in gardens, especially small ones, are the herbs, scattered hither and thither all over the place, and time and patience are exhausted in hunting them up when required. Quite a useful feature might be made in every garden, however small, of the herbs, were they only brought together into one place and arranged in order. The best disposition for herbs is in beds. These may be from 2 to 4 feet wide, with foot alleys between them, and the length almost double, or, at the least, one-third more than the width. This arrangement in beds is the very essence of an herb garden. Of course in small gardens one entire bed will not be needed for any herb. In such cases several kinds may be easily grown together—such, for instance, as common and lemon Thyme, Pennyroyal, and Marjoram in one; Fennel, Sage, and Tarragon in another; and Basil, Summer Savoury, and Golden Purslane in another. Mint should always have a bed for itself, as Mint sauce is much in demand. Chervil, again, is much wanted in many families for salads, also Burnet, Hyssop, &c. These three are the semi-cordial herbs, Horehound for sore throats, Tansy for tea (not that anybody ever drinks it), Camomile for face-ache and stomach ailments, Rue for the gapes in poultry, Lad's Love, and any curious herbs that the villa gardener may have a fancy for. A bed should also be reserved for Angelica, used by those who know the luxury of its shoots candied in sugar, and for the growth of Borage, for flavouring claret cups in hot weather. Again, the herb garden is just the place for the orderly and systematic cultivation of all small salading such as Mustard and Cress, a constant succession of young Onions, a bed of Chives, the cultivation of Radishes throughout the season, and the growth of Rampion, Lettuces, Endive, &c. All this would find abundant furniture for a good many beds, and by changing these for the different products a nice succession of cropping might be maintained. Finally, several beds should be set aside for the high-class cultivation of Parsley—a plant sadly neglected in small gardens. Nothing is more useful in a household for flavouring or garnishing, and it is just as easy, on a right system, to have magnificent leaves, exquisitely curled and clean, because raised high above the ground by their strength and stature, as to have and use the small dirty leaves that have to do duty as Parsley in so many houses. Let the Parsley have a bed of rich deep soil—if a yard deep all the better; sow a good curled kind thinly; as soon as fairly up thin the plants to a foot apart, and let them grow away freely. That is the whole art of growing and using Parsley, and making it really one of the most beautiful plants in the garden. Sow in March, May, and July for succession. If the garden of herbs is too small for the devotion of

one or more beds to Parsley, sown at different seasons, then the whole herb garden might be fringed round with Parsley, and the garnishing and flavouring plants themselves be garnished with its beauty. No portion of any garden, large or small, not even excluding that wholly devoted to flowers, will afford more pleasure than an herb garden well furnished and kept. There will always be something growing and doing in it.—“Villa Gardener.”

THE FLOWER GARDEN.

HARDINESS OF BEGONIAS OF THE REX SECTION.

Few plants have been greater favourites than the different varieties of the Rex section of Begonias, which have, however, dropped prematurely out of cultivation, or into places of third-rate importance. Few plants are more striking than Begonia Rex, Marshallii, Duchesse de Brabant, Queen Victoria, Comte de Lemminghe, with their endless hybrids of every shade and degree of variegation. But their rapid increase and great variety seemed to produce a reaction that has ended in driving most of the varieties of this section quite out of the seed catalogues. This is to be regretted, as few plants are more useful, easier cultivated, or enjoy more immunity from insects than Begonias. As to propagation, any portion of a leaf with a prominent vein is convertible into an independent plant, and any number can be raised from seeds. In fact it



Begonia of the Rex section.

was partly this facility of increase that led to the present reaction against Begonias of this class. They were multiplied unduly in most collections, to the displacement of plants of more permanent value. They were also unfortunate, perhaps, in not finding at once their proper places, which were obviously baskets, brackets, and walls. Strikingly beautiful, as pot specimen Begonias are, most of them were more so when overhanging a basket, depending from a bracket, or clothing the bricks, or stones, and walls with beauty. In no position are they more useful or effective than as wall plants. The half-creeping stems and leaves look best when depending from, or displaying themselves close to a wall. Small semicircular pots of cement stone, or clinkers, may easily be made on or suspended from walls. These will suffice to grow variegated Begonias in for years. The object is not single specimens, but successfully well-formed, properly-shaped leaves, the smaller in size the better. The cramping of some of the varieties into small root spaces alters, and, for this purpose, improves their character. The stems become much shorter, the leaves smaller, and, of course, there is room for more in number. In corners, and in recesses, at the ends, or under stages, larger places may be found to take full-sized plants. It is astonishing how well these Begonias grow and colour in shady places. They are equally beautiful grown against a back wall as in full sunshine, the white of some of the varieties being even more silvery, and the green more verdant in shady places than in exposed ones. Even the reddish-leaved varieties have been found to keep their colour well in the shade; and some of those delicate hardy

strains in the way of Comte de Lemminghe, that seem as if their surfaces were sprinkled over with gold-dust, put on a higher beauty in the shade. I now come to the last and most important point of all. Most of these variegated Begonias have been reckoned and treated as stove-plants; doubtless, too, they will live and flourish in a high temperature; but so they also will in a low one. In the coolest greenhouses they may be grown well and in safety. For many years past, a back wall of a flower passage or verandah has been furnished with these variegated Begonias in home-made cement pots, after the pattern of the Fern bricks made by different firms. In winter the thermometer has frequently been down to 30° (within the last month it has been as low as 20°), and yet the Begonias show no sign of injury. Part of the passage has an opaque top, and front lights are furnished with plants, and, in fact, there is a large proportion of wall. The light is, consequently, much intercepted, yet these Begonias, in spite of the shade and the cold, continue to thrive, and do their part well in covering the bare wall. Some years ago we tried bedding out Begonia Rex, Marshallii, and others, and tried 500 plants in a ribbon border. They were not satisfactory, and the experiments were not repeated. They suffered, however, from an excess of heat, not cold. The sun burnt them brown. Since then I have frequently seen plants in sheltered positions in the open air looking pictures of health and beauty; but though they will never be popular as bedding nor even as sub-tropical plants, they ought not to be overlooked where plants suitable for the furnishing of conservatories and greenhouses and other shady and covered places, are in demand. During winter, and in a temperature under 40°, variegated Begonias should be kept rather dry and in a semi-dormant state. The object of low temperatures should be to conserve the old, not to develop new beauty. Doubtless young plants in full growth, taken from the plant-stove and placed in such temperatures as are here indicated, would be killed outright, thus adding another proof of the fact, which cannot be too often repeated, that hardiness is a matter of condition, more, even, than of constitution or species. No plant can be called altogether hardy when in full growth. Take the Oak in June and expose it to 10° of frost, and you will kill its young growth, though it had stood bravely out against zero only four months previously; and so in degree with all plants. If you want them to be hardy, secure a strong habit and well-ripened wood and leaves, and you make them so. Reverse these conditions, and the same amount of frost will kill them at once.

D. T. FISH.

BEDDING PLANTS IN THE PARC MONCEAU.

ONE of the most beautiful and instructive gardens about Paris (says a friend of mine, writing from the Jardin des Plantes) is the little Parc Monceau near the Arc de Triomphe. Its beauty and tasteful arrangement, the perfect order in which it is always kept, and the great variety of choice plants which it contains, make it a delightful resort for Parisians, but especially for those interested in the skilful disposition of bedding plants. I have, therefore, thought that a list of the plants used for embellishing the grounds in 1874 might be of interest to English gardeners. The open places about the shrubberies were given up to such ornamental plants as harmonised best with the adjacent foliage, such as Solanums, Datura arborea, Tagetes, Begonia Evansiana, Iberis umbellata, Dahlias, especially the lili-putian varieties, Antirrhinums, Dianthus plumarius, and D. barbatus, Petunias, Abutilon, varieties with spotted leaves, as A. Thomsonii, A. erectum, A. striatum, &c. There were also many fine Heliotropes and many bright coloured perennial Phloxes, Fuchsias, &c. Judiciously interspersed among the unusually large and effective beds of Negundo fraxinifolia variegata were Roses, Beta purpurea, Amaranthus salicifolius, Tritoma Uvaria, Antirrhinums, and other plants, arranged with much skill, and in a manner most pleasing to the eye; and these, again, were surrounded by ribbons of scarlet Pelargoniums; indeed, most of the shrubberies were edged with some such plants as Pelargoniums, Sedums, Lamium maculatum, Chrysanthemum grandiflorum and frutescens, Veronica Andersonii or V. Lindleyana, Iberis, Lobelia speciosa, and others. Pelargonium peltatum and coccineum did not harmonise well, I think, in this way, and Fuchsia corymbiflora would have looked better in a single row. I would not recommend the ribbon-border style, as the even lines always destroy, to a great extent, the otherwise perfect appearance

of the shrubby margins, nor do I think it advisable, when planting the shrubberies, to make the choice of shrubs subservient to that of flowers when endeavouring to produce a contrast to or rather to suit these cordons. For example, all the marginal plants consist of such species as *Euonymus japonicus*. Perhaps these ribbons were extensively used in order to provide substitutes for tropical or sub-tropical plants, which everywhere find a place on the lawns. There were grown as isolated individuals such plants as *Ferula*, *Bambusa*, *Rheum Emodi*, tall *Dracenas*, *Boehmerias*, *Acanthus lusitanicus*, *Strelitzia angusta*, *Gynieriums*, *Lycopersicum esculentum*, *Phytolacca decandra*, *Palms*, *Solanum marginatum*, *Amorphophallus*, *Struthiopteris germanica*, *Polygonum Sieboldii*. Amongst a number of *Deodars*, fine *Agaves* were planted. Beds were formed of *Cineraria platanifolia*, *Gnaphalium lanatum*, *Begonia viridifolia*, *B. Rex*, and others in a carpet of *Selaginella denticulata*. In the beds, mixed according to size and taste, were the following:—*Ficus elastica*, *Colocasia*, *Cuphea platycentra*, *Phormium tenax*, *Wigandias*, and *Petunias*; while *Dahlias* with variegated foliage, white *Lantanas*, *Erythrin*as, and *Coleus* of different varieties brightened the view. *Saccharum officinarum* was set in the centres of beds, with plants of slower habits around it, such as *Centaureas* and *Lobelias*, *Erythrina*, *Pelargonium peltatum*, with *Iresine Lindenii* and *Herbstii*; *Coccoloba*, *Diervilla*, with scarlet and other *Pelargoniums*, *Königa maritima*, flowering *Lobelias* and *Begonias*, surrounded by *Erigeron mucronatus*. *Magnolia grandiflora*, a fine specimen, was surrounded by tall *Ficus elastica*, so as to form a beautiful pyramid; *Pelargoniums*, *Musa Cavendishii*, and *Coleuses* were found in another bed. *Cereus peruvianus monstrosus* and *Cuphea platycentra* were mingled with *Begonia nitida*, and *Begonias* having scarlet flowers with *Königa variegata*. *Ricinus*, *Tagetes*, *Erythrin*as, and white variegated kinds of *Pelargoniums*, *Aralia japonica*, *Gnaphaliums*, *Cyperus alternifolius* and *Begonia Evansiana*, *Jacksoni*, *Warszewiczii*; double *Heliotropes* were mixed with double *Portulaca*, *Cannas*, *Centaureas*, and red and white flowered *Verbenas*. There were also beds with tree and other *Ferns* and *Aroids*, *Aspidistras*, *Palms*, *Musa Ensete*, with *Sedums* of various kinds. A very fine specimen of rock-work found a place there, the fountain connected with which is very well constructed. The plants enumerated are those which seem to thrive best in the open air in Paris, and can be shown to the greatest advantage if well arranged. A common mistake among flower gardeners is to try to arrange their bedding plants in a formal manner, which reminds one of a clipped hedge. In my opinion no style is better or more graceful than that which gives plants room to grow, and allows each to display to advantage its own peculiar habit.

JOHN BRENNAN.

Loughgall.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Gladiolus præcox.—This pretty little early pink-flowered *Gladiolus* has been blooming with us here ever since December. A potful of it, assorted with such plants as *Triteleia* and *Iris reticulata*, has a strikingly pretty appearance.—T. S. WARE, *Tottenham*.

A Poetical Tribute to the Rose.—A German lady, Countess Prokesch, has collected into a volume all the poems which could be gathered together from the works of German poets in honour of the Rose. It is said that royalty figures largely in this poetic Rose garden.

Campanula Barrelieri, Ferula nobilis, and Sparaxis.—Of these, the first seems quite uninjured by the severe frost (20° here). The same may be said of *Ferula nobilis* and *Sparaxis pulcherrima*. The first is a grand Fennel, the foliage of which had turned a lovely orange-yellow when I saw it at Messrs. Backhouse's nursery at York in September. The *Sparaxis pulcherrima* was in fine bloom there, as was also its still more beautiful relation *Sparaxis pulcherrima atro-purpurea*, a bell-shaped flower of deep mulberry, on long hair-like stalks 4 or 5 feet high. My soil is a heavy clay, but well manured.—FRANK MILES, *Bingham, Notts*.

Primula altaica (syn. grandiflora).—This is flowering well here on a south bank, and is, to my mind, lovelier than any other *Primula*, hardy or otherwise. In colour it is deep mauve, and larger than any other *Primrose*. Cross the *Primrose* with the deep claret *Primula auriculæflora* and the result will be a rich variety of deep violet colour. I am anxiously waiting for a large number of *Primroses*, some crossed by Mr. Dean, of Ealing, but the majority crossed and raised by myself. *Primrose* seed, which should be gathered and sown as soon as it is ripe, is sometimes a long time germinating; it is, therefore, best to sow it in pans, and prick out the larger plants.—FRANK MILES.

A Bouquet of Hardy Flowers.—I send you a few flowers gathered out-of-doors to show how warm and mild it is here; we have not had much severe weather. The thermometer never fell to 20°; we had but one fall of snow, which averaged 6 inches in depth; it remained with us about four days, and on the approach of the New Year disappeared in one night. Since then the weather has been wet and warm, and trees and herbs are filling their buds fast. I send *Garrya elliptica* (the male plant of which is one of the most distinct of winter-flowering shrubs), *Lonicera fragrantissima*, *Berberis japonica*, *Snowdrops*, *Pyrus japonica*, *Jasminum nudiflorum*, and the common yellow *Aconite* (which is generally considered the earliest of all hardy flowers), *Daphne hybrida*, *D. Pontica*, and *Arabis verna*, the latter a little gem which I found growing on the Grampian Hills fifty-five years ago and have grown it ever since.—J. SCOTT, *Crewkerne, Somersetshire*.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Dressing Strawberry Beds.—If these have not yet received their winter dressing, as advised at the close of the year, they should be attended to forthwith when the weather is open. If the soil is of a heavy and retentive nature, it is better to fork over the ground a few inches deep between the rows, without much disturbing the roots, as, if this be not done on such soils, it gets so much solidified by trampling in gathering the fruit that the rains run off instead of penetrating; and if weeds have been allowed to grow to any extent, it is necessary to dispose of them by digging in, for, if hoed up and raked off, so much soil is removed in the operation as to injure the ground and leave the roots bare; but where cleanly cultivation is followed up, and weeds kept down, except in slightly loosening the surface with the object of permitting the rains to pass through, the less the ground among Strawberries is dug the better. Where this shallow turning up is necessary, the spade should never be used, but only the fork. In light soils the hoe is all that is required to destroy weeds, which should be cut off whilst small, and never allowed to get large and numerous, necessitating their removal with the consequent loss of soil that adheres to them, more or less, according as the surface is dry or otherwise.

The Jerusalem Artichoke.—This, with some, is a favourite vegetable. It gives variety through the winter season, when there is not a wide area of choice. It will succeed where most other vegetables will not grow. To the reputation it thus has may be attributed the little attention it receives, and the consequent unsatisfactory state in which it is too often seen. Although somewhat of a surface-rooting plant, it likes a moderately deep well-prepared soil; there is no necessity, nor is it advisable, to select any situation in the vegetable ground for this Artichoke which might be better occupied by something else, yet it should not be planted where the soil is impoverished by the roots of trees or overshadowed by their branches. Dig the ground well, and, if poor, give it a moderate dressing of manure, mixing it well with the soil. Pieces of the tubers about as large as moderate-sized Kidney Potatoes should be planted with a dibber about the beginning of March, when the weather is open, in rows 12 inches apart, with 2 feet between the rows. Cover the plants with about 4 inches of soil; through the spring remove any weeds that make their appearance. When the plants get fairly into growth their dense habit of growth will prevent anything in the shape of annual weeds growing amongst them.

Spring Cabbages.—If there is an insufficiency of spring Cabbages already planted out, more may be planted from the reserve bed, where they were pricked out in the autumn, and which should always exist to supply blanks that occur through the attacks of slugs or other causes. As the ground is cleared from Savoy and Brussels Sprouts, let the old stools be removed, and the place they have occupied dug, always performing this operation—even when going but a single spit deep—well, by getting as deep as the spade or fork will reach. If the ground requires trenching, which it does once in three years, bury the stools and leaves in the bottom. It is a good way to have a rough plan of every vegetable garden, with the crops of the preceding year. This takes very little time to prepare, and is of great assistance in regulating the rotation of cropping, which it is always advisable to carry out.

Rotation of Crops.—Never crop the ground two seasons running with either the same species of vegetable, or with any similar in their habit by being surface or deep rooters. Surface-rooting plants, like all the Brassicas, including Cabbages, Cauliflowers, or Broccoli, are the best to follow such deep-rooting crops as Onions or Broad Beans; plant Lettuce after Celery, and also Peas, for, although the latter are deep-rooted plants, the Celery is an excellent preparatory crop for them, as it is for other vegetables. Potatoes do well upon ground that has grown Strawberries, especially if they were dug up as soon as the fruit was ripe and a crop of autumn Turnips taken from it. Strawberries prepare the ground for root-crops better than anything else grown in the kitchen garden. If a rough plan such as I have alluded to has been prepared and marked whilst the crops are growing, it shows at once, even after the ground is cleared and dug, how to go on with this changing of crops, which it is well to carry out. Where the soil of a garden happens to be too heavy and retentive, it may be much improved, if in a neighbourhood where either pit or river-sand can be had cheaply and in sufficient quantities; a dressing of 6 inches will not be too much, digging it in one spit deep and mixing it well through the soil. Even fine-sifted ashes will improve the texture of such land if applied. The winter season, when the ground is vacant, is the best time for getting it in. Where the soil, on the other hand, is too light and sandy, it is even more necessary to find a remedy, for very light land is ill.

adapted for summer vegetable growing. It can, however, be improved by the application of marl or clay. The former is the best if obtainable, and it frequently happens that in cutting deep drains it can be got at a moderate cost. Good yellow clay is not a bad substitute for marl; whichever is used, it may with advantage be put on from 4 to 6 inches thick, but must not be dug in the ground in a raw adhesive state; the present is a good time for applying it to the surface of land that has not to be cropped until late in the spring, so as to give it the benefit of the weather. March is the best month for pulverising it; it may be put on between the rows of Cabbage plants or on ground occupied with spring Broccoli; 2 or 3 inches placed between the rows of Strawberries on light land will be of the greatest service to them; in short, a dressing of this can be given with very great advantage, either to naturally light gardens or to such as are getting so through the long continued application of stable manure and vegetable matter. In cold, late, exposed situations, not suited for early sowing of Peas in the open ground, a fortnight may be gained by sowing them in a cold Vinery, pit, or frame. Nothing is better than the method of using strips of turf 6 inches wide and about 4 inches in thickness, laid the grassy-side down on borders. Cut a channel down the centre of the turf a couple of inches deep; in this sow the Peas, covering them with fine soil. They will soon begin to grow, the boards preventing their roots descending into the floor of the house or pit; and, when 6 inches high, they can in March be planted in shallow trenches by merely slipping the whole off the boards. If turf is not to be had readily, boards slightly nailed together so as to form a sort of shallow gutter will answer the purpose, or common iron gutterings in lengths, or horse-shoe drain-tiles can be used. In planting, it is only necessary to slip the whole plants and soil entire into the trenches opened for them. Some Celery seed should also be sown in a little heat in pans or boxes filled with fine sifted sandy soil, from which the plants can be pricked out as soon as large enough for handling without injuring their roots, wherein, if the soil in which the seed is sown is lumpy and strong, the roots must necessarily get much broken in moving, which checks the plants, a circumstance that should not occur in the cultivation of this vegetable.

Lawns.—Keep wormcasts regularly swept from lawns, and roll the Grass. For this purpose there is nothing so good as a wooden roller: it should be made of Oak or Elm, and ought to be about 12 inches in diameter and 4 feet in breadth. This will not only keep the surface smooth as well as an iron roller, but it will do away with the necessity of much sweeping; and the labour of rolling with this wooden implement is so much less than with an iron one, that it will not occupy more than half the time.

Gravel Walks.—Nothing adds more to the comfort, as well as the appearance, of a garden than good walks; but, to have these, they must not only be composed of suitable materials, but they must be well made—that is, in the first construction they must be thoroughly drained, properly formed, both as regards the surface and foundations, and the materials of which they are made rightly placed. To make a walk 5 or 6 feet in width, the ground should be excavated to a depth of 12 inches, 2 inches lower at the sides than in the middle; on each side must be a drain, the pipes that form which should be sufficiently large in proportion to the length of the walk, so as to carry off the surface-water in heavy storms, and with a sufficient number of eyes to prevent an accumulation of water on the surface of the walk. A sufficiency of these eyes in walks is more the exception than the rule, through which cause the gravel becomes displaced every time a heavy thunder-shower occurs. In the bottom of the walk place 4 inches of broken bricks, stone-rubble, or ballast—whichever can be easiest obtained; ram this quite solid, on it put on 2 or 3 inches of coarse gravel, and fill up with fine, making the centre of the walk a couple of inches higher than the sides and keeping the grids over the eyes a couple of inches lower, with the surface gradually falling to them; this not only enables the water to run freely into them, but prevents their standing up too high to take it when the surface of the walk gets lowered by gradual wear. A walk so made, if the gravel is good, will always be dry, and in condition to walk upon with comfort, and free from the accumulation of Moss that exists upon walks that are not properly drained. Where walks require re-gravelling, it should be done at once, so that the new gravel may get properly set before the dry weather sets in; this saves an immense amount of labour in rolling, and renders them comfortable to walk upon during the ensuing summer.

Greenhouses and Pits.—Introduce a few more bulbs into the stove, or warm pit, as also flowering Shrubs, such as *Deutzia gracilis*, double *Prunus*, *Kalmias*, and small *Rhododendrons*, *Lily of the Valley*, and also a plant or two of *Azalea*; the white sorts are the most useful for forcing, being more esteemed for cutting. The small purple *A. amœna* is very useful for this purpose, as well as the yellow-flowered *Cytisus racemosus*, which will come into bloom with

little heat. If there have been prepared early in the autumn a few pots of the always acceptable *Mignonette*, a little warmth will assist its flowers to open. Keep these plants near the glass, so that they do not become drawn, and tie them out neatly to a few thin sticks. Go over the plants in the greenhouse every week, removing all decayed leaves and washing the pots when necessary, so as to remove the green mould. Attend to watering, and look over the whole stock sufficiently often to see that nothing suffers through getting too dry. Lilies that are pushing through the soil must now have more water given them. Even when not apparent above the surface, the soil must not be allowed to become quite dry, as the roots are now on the move and require water. Cuttings of *Verbenas* and *Fuchsias* should now be put in to strike. They will root anywhere where they can receive a little heat under a bell-glass in sandy soil. Old *Fuchsias*, that have been dried off in the autumn, may now be pruned. The branches should be cut well in, and reduced considerably in height. They may then at once be placed in heat, and, as soon as they have pushed half-an-inch of growth, may be shook out and re-potted. Soil, if not under cover for the general potting of greenhouse plants, should be placed in a dry open shed, where it will receive plenty of air; lay it as open as possible for this purpose, and occasionally turn it over. Sand, also, should be placed where it will dry.

TREES AND SHRUBS.

MAGNOLIAS.

It is rather early, perhaps, in the season to think about gardening; still, I have been reckoning up the weeks which must pass before the first flowers of spring appear. First will come *Snowdrops*, *Crocus*, and similar low-growing plants, then the pink *Mezereon* and golden *Forsythia*, followed, a few days later, by the showy Chinese *Magnolias*. This reminds me that neither the native nor exotic species of the *Magnolia* are half so plentiful, either in suburban or country grounds, as their merits deserve. Perhaps one barrier to their more extensive culture has been the high price charged by our nurserymen for trees of a suitable size for transplanting; but this in a measure is being obviated by the increase in numbers of propagators, which tends to competition and the lowering of prices. Another obstacle to their culture is the great care required to make the trees live when transplanted; not that the operation is so very difficult, but a certain amount and a certain kind of care is necessary to success. The roots must never be allowed to become dry or in the least shrivelled during the time of removal; neither will it answer to puddle the roots with clay, as frequently practised on more hard-wooded kinds of trees. Then, again, it is not safe to plant *Magnolias* in the autumn, especially in cold climates, where the wounds made on the soft spongy roots are exposed to cold wet earth during a long winter. But, if carefully dug, and as carefully packed in Moss, or well wrapped in some similar material while being transported from the nursery to the place where they are to be set out, followed by ordinary good care in planting, there is very little danger of *Magnolias* dying.

Desirable Species and Varieties.

The Chinese species are, as a class, far more showy than the American, although the trees do not grow as large as some of the natives. *Magnolia conspicua* is one of the very best of the Chinese species, its flowers being large, pure white, and appear before the leaves in spring, making a grand show at a season when one is likely to admire such sights more than at any other. Next to this I would place *M. soulangeana*, which is said to be a hybrid of this and the next. Its flowers are white, tinged or striped with purple, and appear at the same time as the *conspicua*. *M. purpurea* is another of the same origin; but the flowers are purple on the outside and nearly white within, but appear a little later than the first, and before the leaves are fully expanded. A variety of this tree, known as *M. Norbertiana*, has deep purple flowers; otherwise, it is very similar to its parent. *Lenné* is a comparatively new sort, with quite large reddish flowers, which promises to be of considerable value. There are also several other Chinese varieties; but those mentioned above are the best I have seen. Among American species, *M. grandiflora*, of the Southern

States, is a superb evergreen tree, and frequently seen in gardens in the south of England, and in many parts of temperate Europe. *M. acuminata*, better known as the Cucumber tree, grows to a tall handsome tree; and, being a native of the Northern States, it is quite hardy. The flowers are about 3 inches broad, and of a pale yellowish colour, appearing late in spring. It is an elegant rapid-growing ornamental tree, readily propagated from seed, and is quite abundant in our nurseries. *M. cordata*, or yellow-flowered, is a native of the Southern States; but is quite hardy, even in New England. It is a low-growing tree, and not particularly desirable, except as a variety in extensive grounds. *M. macrophylla*, or the great-leaved Magnolia, is not perfectly hardy in the extreme Northern States, but succeeds very well in the Middle States. The branches are very coarse and few in number; the wood is also quite brittle, consequently, when the trees become large, they are liable to be injured by the wind unless growing in a somewhat protected position. The flowers are white and very large, usually from 10 to 12 inches in diameter. A noble, tropical-looking tree, and well worthy of culture. *M. umbrellata*, or Umbrella Magnolia, also called *M. tripetala*, or three-petalled, is a tree somewhat like the last, but the leaves and flowers are smaller. The tree is also more hardy, and grows a little taller, but does not quite equal the next in height. *M. Fraseri*, sometimes called *M. auriculata*, or the ear-leaved Magnolia, is quite a handsome tree, and hardy as any of the species found in the Middle States. Trees suitable for planting out of any and all of these kinds, can be had at our nurseries, and also the sweetest scented, and, I had almost said, best of all, the *M. glauca*, or small sweet-scented Magnolia, also known as Sweet Bay. Common as this shrub or small tree is in the swamps of some of our Northern States, it is far too seldom seen under cultivation. It is my first choice among the Magnolias, and I should try to find a place for "just one more" if it came in my way. The leaves are oblong, deep green above, and whitish beneath, remaining on the plants nearly the entire winter. Flowers are about 2 inches in diameter, pure white, and deliciously fragrant. Plants taken from the swamps are not likely to die if severely pruned at the time of removal.—"Moore's Rural New Yorker." [The last-named species, so highly praised here, thrives freely in England, and is unsurpassed among our flowering shrubs. The specimens at Knowle Park have attained to the dignity of low-spreading trees, and bear numbers of large and fragrant flowers.]

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Starch from Horse Chestnuts.—A patent was granted in the year 1796 to Lord William Murray for his discovery of a method of extracting starch from Horse Chestnuts, and a paste or size has been made from them which is preferred by bookbinders, shoemakers, and paperhangers to that made from wheaten flour.

The Almond Peach (*Amygdalus grandiflora*).—This is a vigorous little tree with branches that are far-spreading and slightly incurved, forming a rounded head. In February and March it produces flowers of a very beautiful rose colour, and large sub-spherical fruit which, however, possesses scarcely any flavour. It is (says M. Carrière in "Revue Horticole") the Almond Peach of some horticulturists, a curious and ornamental form, and, like many others among the *Amygdali*, an intermediate type.

Preservation of Wood.—According to Hatzfield, sulphate of copper gives imperfect and variable results as regards the preservation of wood, because of its solubility in water; and creosote does not fulfil all the necessary conditions, on account of its scarcity and high price. He proposes ferrous acid-tannate. This compound, which is soluble, is transformed under the influence of air into an insoluble salt of an intense black colour; it is deposited in the cells of the wood in a solid state, and produces a sort of petrification which augments the durability resulting from the action of tannic acid alone.

Olive Growing.—In answer to your correspondent "G. R. H." (see p. 42), allow me to say that the best way known here of growing Olive trees is to propagate them by means of cutting fresh bits of wood, with the bark on them, from old clumps at the roots of these trees, something after the manner of cutting up Potatoes for seedling. These bits of wood must be placed in pots and well cared for, till the plant is a year or two of age. The soil in these pots should be moderately rich, and kept moist. Cultivators here usually bury the pots till the plant is well started in growth. When the stem is about the thickness of a finger, the plant should be set out in the place it is to occupy. The soil should be neither too rich nor too poor, and should be well drained. The Olive requires hilly country, where it can have plenty of exposure, and where the climate is dry and temperate, like that of Tuscany. The manure used for it should consist of well-rotted horse droppings, old woollen rags, and chips of leather. The tree will bear a few berries when four or five years old, but the full crop is not produced till the age of twenty years, or so has been attained. The plants should be trained like Lemon trees, i.e., open in the centre, or cup-shaped.—PERSTON POWERS, Florence.

OLD TREES AT FULHAM PALACE.

AMONG the materials at our disposal for the embellishment of residences, it has been rightly said, that none are at once so highly ornamental, so indispensable, and so easily dealt with as trees. Buildings, even unsightly in appearance, by means of judicious planting, may often be made to look highly interesting, provided trees suitable to the situation are selected and properly planted. Architects often plant such surroundings badly, owing to a want of knowledge of the materials with which they have to deal, the proportions they will attain, and the ultimate effect they will produce, when fully grown. Fulham Palace, as will be seen by our illustration, is a plain unpretentious building; nevertheless, for its deficiencies in the way of architectural embellishment, we have ample compensation in the fine trees by which it is surrounded. On the left of the house is a venerable Cork tree, which for centuries has withstood the tear and wear of time, the imprint of which is strongly impressed on its great trunk, from which, at least one aged arm has been separated, and, as will be seen, has been used as a support for the main body of the tree. This tree was planted about the end of the sixteenth century, most probably by Bishop Compton, whose skill as a planter, and perseverance as an introducer of American trees, are well-known. The tree on the right which has been planted as a companion to the old Cork tree, is the Robinia or False Acacia, of the great value of whose wood Cobbett long ago wrote in such extravagant terms. No place in England contains so many full-grown Virginian trees as Fulham Palace, and most of them have been raised from seeds sent to this country by the missionaries who first went to North America in Bishop Compton's time. The spot on which these men first preached to the native Indians near Richmond, in Virginia, is now the site of a mansion, in front of which are two trees of the White Oak (*Quercus alba*), placed so as to balance each other, just like the two trees at Fulham, as shown in the illustration. The trunk of one of these Oaks I measured, and found it to be, at 3 feet from the ground, 21 feet in circumference; the other was 18 feet in circumference. These trees cover so much space, that if they had been planted anywhere near the building, they must have been removed long before full beauty had been reached. At Fulham, we get a notion of the colossal dimensions which these American trees acquire when fully grown, and therefore intending planters who have not seen them in their native country, as I have done, will do well to inspect them before commencing operations, especially such as have to plant in the neighbourhood of buildings. At Fulham, too, may be seen a flat piece of ground, consisting of some 30 acres, rendered interesting wholly by trees; by their aid objectionable features are shut out, and others of a suitable character are brought into view, and altogether as much variety is thus secured as is to be found in the most extensive estate or domain in the country. Conspicuous among the trees employed for this purpose may be named a Hickory, which has a trunk 16 feet in circumference, and 15 feet in height, clear of branches. It then divides into two huge limbs, each 80 feet in height. The Hickory becomes exceedingly beautiful in autumn; the leaves, which during summer are of a bright airy green, turn yellow as the season advances, and hang upon the tree for a month or six weeks after the change takes place. No tree, indeed, even in its native country, is more strikingly beautiful in the fall than this, especially when associated with Liquidamber and scarlet Oaks or silver Maples—all trees remarkable for fine colours. Of the black Walnut, which is one of the most useful of American trees, and one which is now becoming scarce even in Virginia, so much is its timber sought after, there are here fine specimens, as well as of American Oaks, especially the white one, a tree of which measures, at 3 feet from the ground, 12 feet in circumference; the wood of this Oak is almost as elastic and valuable as that of the Hickory, and, indeed, the white Oak is considered to be one of the very best of American timber trees. Of the Tulip tree, one of the best specimens in the country stands on the lawn at Fulham, and among trees possessing beauty of another kind may be named the *Gleditschia triacanthos*, or Honey Locust, so named on account of the sweet pods which it bears; the spines of this,



VIEW IN THE GARDENS AT FULHAM PALACE.

which are long and formidable, are associated with foliage almost as light and pretty as that of the Sensitive plant. Of the Judas tree there is here a fine standard, and also a grand old Cedar of Lebanon, from a seat beneath which a pretty little flower garden is overlooked. These, and many other trees, too numerous to mention, are set in an irregular framework of splendid Elms, both in the adjoining park and on the banks of the Thames. Vistas have of late years been cut through the boundary line, so as to bring in occasional glimpses of the Thames, and in this way increased interest has been given to the place. Around the whole of the ornamental department is a well kept gravel walk—tortuous here, straight there, but so managed as to give the visitor to the grounds an idea of extent considerably beyond that which they actually possess. The lawn boundary has been framed by a master hand—here bold and projecting, there deep and shadowy; at one point glowing with colour, at another depending for beauty on leafage only, and the whole, when in full summer beauty, forming one of the most charming pictures to be found anywhere. JOSEPH NEWTON.

LARGE BOILERS AND FURNACES BETTER THAN SMALL ONES.

I CAN fully corroborate all that Mr. Fish says (see p. 58) with regard to the wisdom and economy of having plenty of boiler power in proportion to the amount of heating required. The first outlay in putting in a larger-sized boiler is very soon saved in fuel. A small boiler has not the capacity for taking the same amount of heat from a given amount of coal that a larger one has. The same rule more than holds good in reference to the amount of piping that is laid in the house to be heated. I had a very striking example of this in these gardens this winter, with the thermometer repeatedly near zero; the only boiler that required to be at all driven to do its work (the whole of the boilers being castings from one mould, and circumstanced alike in all respects) is the one with by far the least piping attached to it—the reason of this being that the houses it heats have less piping in them than the others, and had to be made much hotter in consequence. Ample boiler power and ample piping are the great secrets of economical heating. Regarding the levels at which boilers should be fixed in relation to the pipes, I have proved that if the return opening into the boiler is below any other portion of the pipes to be heated, it does not matter if the flow opening is above the body of the pipes. One of the most efficient heating apparatuses I ever worked had the flow pipe starting down hill immediately it left the boiler, but at no part did the water descend below the return opening into the boiler. Looking at the law of hot-water circulation, I should say that such an arrangement was sound, for, immediately the water leaves the boiler, it begins to part with its heat; cools, and becomes of a greater specific gravity; and surely, from that fact, its natural vent is down hill, not up. And I conceive it unnecessary expense to excavate deeply into the ground for the mere sake of getting “a good rise from the boiler,” as is so often spoken of. I can endorse what Mr. Fish says about the undesireableness and waste of small furnaces. In arrangements recently carried out here, I have had furnaces made 19 inches deep, and 21 inches wide. The boilers form the furnaces, the said boilers being a combination of the saddle and cruciform, and are 6 feet long. A small furnace requires a smart firing draft, to give the same amount of heat that a larger body of coal gives with less of a draft. For, with a large body of hot glowing coal, the doors and dampers can be so regulated as to cause a red mass of fuel to lie for hours in a condition to give off a powerful heat. A larger body of fire requires to be less often fed, and the fire is more constantly “red hot;” whereas a small furnace requires to be going at high pressure, and be often fed, and the waste of coal and heat is greater. The larger furnace can be left a longer time safely without attendance. I cannot agree with Mr. Fish in saying that the shape of the boiler is of less moment than its size. I think the shape of a boiler important, and those boilers that give most heating surface in direct contact with the fire I have always found to be the most powerful. The more of a boiler that

is licked with flame, and against which most glowing red coal rests, must surely be the best, and shape has more to do with this, I think, than size. Not an atom of brick should form any part of the furnace or fire-place of a boiler. It should be water above, below, and at the sides; and, besides, a large boiler-surface in direct contact with the fire, the draught should traverse about every inch of the boiler two or three times before it is allowed to escape with such an enormous amount of heat into the flue or chimney. D. THOMSON.

Drumlanrig Gardens.

YOUR correspondent, Mr. D. T. Fish, has called attention to a very important matter, for the late severe weather has brought home to most of us the necessity and great economy of having boilers of sufficient power to cope with such seasons without much extra strain. Even with these it is often lamentable to see the great waste that takes place through unskilful stoking. This is almost as important a matter as having efficient boilers; for it is easy to get the same amount of heat in the pipes with much less fuel than is generally used, if the stoking be conducted with a little more thought and skill. It is but too common a practice with those in charge of fires to have ashpit-doors and damper wide open, thus admitting a large body of cold air through the furnace that carries the heat up the shaft with a rush. If this damper were used, as it should be, to keep the heat playing slowly over the surface of the boiler, much waste would be avoided. It frequently happens that fires are allowed to get too low, and then twice as much fuel is thrown on as is necessary. This leads to the ashpit-door and damper being thrown open to quicken combustion, with the results I have mentioned. With some boilers the fiercest heat is spent in solid brickwork, as was the case here till I had the furnaces lined with 2-inch tubing. These were placed 1 inch apart, and the furnace bricked up at about 2 inches behind them, so as to allow the fire to play right round the tubes. The result has been most satisfactory, as the power of the boilers has been nearly doubled. One furnace contains four of these tubes along each side and back, and the other three; and, as these encase the fire, it will be readily seen how serviceable they are. Boilers should be always so constructed that the fire is fully encased by water, as every brick or other surface not containing water that is exposed to the action of the fire is robbing the coal-heap to no useful purpose. Whatever the form of the boiler, and however fiercely this heat may play on any particular part, the hottest water will be always at the highest point—the top of the boiler, and this is the proper place for the flow to commence. To carry a flow-pipe with a vertical dip must greatly impede the circulation, and lead to loss of heating power. The tendency of all heated liquids is to swell and ascend, and it is of the greatest importance that the top of the boiler should be lower than any of the flows. I quite agree with your correspondent, that every boiler should form its own setting, and that the more the surface that is exposed to the direct action of the fire can be corrugated, so as to increase the heating area of that particular part, and break up the flame, the more powerful and valuable will the boiler be. The first cost of a good boiler being heavy, cheap and inferior ones are often used instead, and these are dear at any price, as they entail a continual outlay for extra fuel that would have been saved by the purchase of a good boiler at starting. There are so many good boilers, that it seems invidious to particularise any single make; but, for moderate cost and real efficiency, the terminal saddle, having tubular bars, is one of the very best, as it entirely encases the fire with water. If the arch of this boiler were only corrugated, it would leave little to be desired; and boilers of this kind can be set in shallow stokeholes, which is an additional recommendation. Besides having boilers of sufficient power, it is of the greatest importance to have plenty of piping, and the economy of this must be apparent to anyone, as it will of course require the water twice as hot in one pipe as it would if two were used to do the same work. If, therefore, we would reduce the yearly cost of coal, it can easily be done by having an efficient boiler, a careful stoker, and plenty of pipes. J. S.

Woolverstone Park.

Wax-yielding Plants.—At a meeting of the Natural Science Society recently held in Hamburg, Mr. G. Wallis remarked that wax was not only obtained from the berries of *Rhus succedanea*—a plant which also supplies the celebrated Japan lacquer, the preparation of which remains a secret—but that three other kinds of wax from entirely distinct trees are known to be obtained in South America. One comes from Northern Brazil, and is produced by the beautiful *Klopstockia cerifera*—called there *Carnauba*—which grows between the fourth and sixth parallels of southern latitude. Another kind is obtained from a *myrica* from Peru and New Granada,

which passes there under the names of Laurel and Olive. This tree grows in a variety of situations, and even at elevations of 5,000 or 6,000 feet above the sea. A third kind of wax is derived from a tree which, up to altitudes of 10,000 feet, grows in the same republics—viz., the Ceroxylon, or Wax Palm. The methods of obtaining the wax from these trees differ greatly, but its subsequent preparation for the manufacture of candles is, in all cases, the same. In the Klopstockia it is obtained from a dusty coating on the leaves. In the Myrica as well as in the Rhus succedanea, it is obtained from the berries, and in the remaining instance it is taken from the stem, which is clothed with a thin mantle of wax, and this is scraped off with an instrument made for the purpose. Mr. Wallis stated that a manufactory exists in Brazil for working the wax into candles, of which he had seen fair specimens made from the Carnauba and Laurel kinds. One great drawback is the bad colour of the wax, for bleaching which no process is known. The Brazilian kind is green, the others rather of bluish or light yellow tints. Large premiums have for years been offered in Brazil for the discovery of a process that will effectually whiten the wax; but as yet they have not produced the desired effect. In Japan they appear to have some process by which it is bleached, but it is doubtful whether it has not already been tried in Brazil. The Ceroxylon produces the whitest wax; but all kinds suffer more or less from a want of consistency, which, unless they are mixed with other substances, renders them useless for the manufacture of really superior candles.

Silica not Essential to Plant Growth.—The idea originated with Sir Humphrey Davy that the siliceous or silica of the soil must be dissolved by the help of alkali, and must enter the plant in order to stiffen the straw of our grains. That idea was thrown out by Davy, not as a positive assertion, but as a suggestion. Knowing that silica was abundant in the slender stems of cereals and grasses, and is but a small ingredient of other plants, he suggests that the silica might serve the office of stiffening the straw, and act as the skeleton of the plant. The facts which demonstrated the falsity of this idea were developed by two of the agricultural investigators of Saxony, viz., by Dr. Julius Sachs, formerly of the Royal Saxon Academy of Agriculture and Forestry, at Tharandt, and by Dr. Wilhelm Knop, of the University of Leipsic, and for some years director of the Moekern experiment station. These gentlemen at the same time, but independently of each other, made numerous trials on the feeding of plants, by stationing their roots in simple water, in which the substances presumed to be needful for growth were dissolved. By this method of operating they could add or exclude any single or several elements to any desired extent, and thus learn the effect of their presence or absence. They found that potash, lime, magnesia, iron, phosphoric acid, sulphuric acid, chlorine, nitric acid and water, united so as to form a very dilute solution, containing not more than one or two-thousandths of solid matters, was able to nourish various plants, and among them Oats and Maize, as perfectly as a rich soil. The solution thus made contained only the minutest quantities of silica, and plants thus produced contained less than one-thousandth of their weight of silica, and yet their strength was equal to that of field-grown corn, containing one and one-half per cent. The trials have been repeated by at least a dozen other experimentalists, and always with the same results. Thus we know positively that we need not trouble ourselves to manure with silica, or to treat the soil for increasing the supply of it; the plant does not require it for strength. Silica enters the plant because you cannot keep it out. The very fact of its extreme variability in the same kind of plant, grown in the same kind of soil, while potash and lime are much less variable, and phosphoric acid is almost an invariable quantity is a sufficient indication that it is not an essential element to the plant.—
PROFESSOR JOHNSON.

Home-grown Tobacco.—The most successful method I know of preparing home-grown Tobacco (see p. 60) is to sow the seed in gentle heat in March. When up, and large enough to handle, prick out the plants in boxes or pans, or pot them singly in small pots, and grow them on until they have filled the pots with roots. It is not desirable that they should be starved before being planted out, which should be done either in May or June, after having been hardened off in the usual way. The best place for planting, especially for those whose space is limited, is between the Asparagus beds, as the roots will then be partially shaded from the hot sun; the soil will be rich, and the plants will soon reach their full size. The best time to commence operations will be as soon as the plants are in flower. The plants may then be pulled up by their roots, and brought together to the potting shed, or some other convenient place, and all the leaves can be stripped off the stalks. They must then be placed out singly, or nearly so, in the full sun, but not on the damp ground. I have found a Quick hedge or a stone wall answer admirably. They become flagged or shrivelled by evening, and they must then be packed (a hamper is the best thing for this), pressed firmly and closely together in layers, and remain there until they commence to heat, when they must be placed out again in the sun. Care must be taken that they are not allowed to remain too long in the hamper after commencing to heat, or they will become mouldy. This must be repeated until the leaves have become quite dry. Nothing now remains but to pack it away in a dry place until required for use. If this system be adopted, your correspondent will be rewarded by a plentiful supply of highly-coloured and highly-perfumed weed.—J. S., Bradford, Yorkshire.

THE GARDEN IN THE HOUSE.

VASES OF FLOWERS.

MANY kinds of flowers are now attainable for floral decoration, and amongst the vases that I have lately arranged myself was one, the bottom of which consisted of a flat glass dish or tazza, raised on a pedestal about 4 inches high; from the centre of this rose a slender glass trumpet, also three spirals of glass, which curved outwards when about 12 or 14 inches above the tazza, and each of these supported a small glass basket. This was for a table ornament in the drawing-room, not for the dinner-table, a purpose for which it would have been useless, as the baskets would have interrupted the view across the table—a point always to be avoided. In the tazza I placed three blooms of *Calla æthiopica*, and, between each of these, sprays of a pinky-mauve-shaded *Primula*, and some Cape Heaths. Round the edge were fronds of the following Ferns:—*Adiantum pedatum*, *Pteris serrulata*, and some golden and silver varieties, so placed as to show the backs of the fronds; while placed so as to “wave out” over the flowers, and, as it were, half shroud them, were three large fronds of Maiden-hair Fern (*A. cuneatum*). In the little suspended baskets I placed sprays of white *Epacris*, and *Cyclamen* of the same shade as the *Primulas* in the tazza, and interspersed throughout the whole was Maiden-hair Fern. In the trumpet were mauve and white *Cyclamen*, Heaths, Roman Hyacinths, and Ferns; and three long sprays of *Lygodium scandens*, which drooped down and mingled with the flowers in the tazza below. The next arrangement which I shall describe, consisted of a basket of flowers, also strictly a drawing-room ornament. It was of white china, of an elegant and graceful shape, and was fitted up with Yellow Allamandas, mauve *Cyclamen*, *Cinerarias*, *Caladium* leaves, and mixed Ferns. The *Caladium* leaves were small in size, and stood up above the flowers with excellent effect. The only drawback to such leaves being introduced into floral arrangements is, that if the plants have not been hardened off previously to being cut, they are apt, when subjected to a dry heated atmosphere, to curl and shrivel, a condition which gives the whole arrangement a faded aspect. The next stands to which I shall allude were large-sized specimen-glasses, a few of which, placed here and there about a sitting-room, and tastefully filled with flowers, form as pretty decorations as any, and they require but few flowers; in fact, more than a dozen of them could be filled with the same number as would be required to fit up the smallest sized stand of the March type. I have seen a few lately fitted in the following manner:—In one was a white *Camellia*, a sprig of scarlet *Geranium*, some spikes of Roman Hyacinths, and fronds of Maiden-hair Fern; another consisted of a yellow Rose-bud, scarlet *Geraniums*, and Ferns; another of a *Gardenia*, some fancy *Pelargonium* blooms, Roman Hyacinths, and some Fern fronds. On Christmas Day, amongst other vases, I arranged four of this shape for placing on the drawing-room mantel-piece, and employed the following flowers:—One contained a large *Gardenia*, some blue *Nemophila*, spikes of white *Epacris*, and Maiden-hair Fern; another, a white *Camellia*, pink *Geraniums* (Christine), pink Heaths, and Ferns; a third, mauve Orchids, Roman Hyacinths, and Maiden Hair Fern; and a fourth, a yellow half-blown Rose-bud, scarlet *Euphorbia*, and white *Cyclamen*. Single blooms can be placed in these glasses if preferred, but in that case the glasses should be of smaller size than any of those just enumerated. If single blooms be selected, they should be of choice varieties and perfect specimens of their kind, such as a handsome *Eucharis*, Orchid, *Gardenia*, Rose, or *Camellia*, and they should always have plenty of Maiden-hair Fern associated with them; in fact, each bloom should be set in a little bower of greenery, and a tiny spray should be drawn across the bloom, so as to tone down and at the same time set off the flower thus situated. Many often hesitate to use much Maiden-hair Fern in their floral arrangements, under the impression that fronds of this Fern last but a short period; this is, however, a mistake, as, if the plants from which the fronds are cut be well hardened off beforehand, they will last quite as long as, if not longer than, the flowers with which they are associated.

A. HASSARD.

THE INDOOR GARDEN.

FORCING FLOWERS.

IN forcing, the first consideration for amateurs should be to secure plants of full and decided maturity and in perfect health, if not luxuriant, for it will invariably be found that the beauty of the flower will depend very much on the growth of the previous year, and, all other circumstances being the same, will be rich or meagre, in exact proportion to its vigour. Then the plants intended to be used should be thoroughly established before they are introduced to a warmer atmosphere, otherwise they will not have acquired the means which are necessary for immediately supplying aliment to meet the demands of an increased circulation. Amongst the plants usually selected for forcing, the bulbous-rooted and herbaceous, which form an entirely new set of organs every year, may be

fortnight will generally be long enough, the hard-wooded may be kept a little longer, and then introduced to the stove. In the ordinary development of the organs of a plant, growth first commences at the root and proceeds gradually upwards, as we may observe in the bursting of the leaf and the formation and expanding of the flower-bud. Now, under these well-known circumstances, it would be absurd to place a plant into a high temperature at first, for then the action would commence at the stem, or above the roots, and, of course, the result would be an abortive production of leaves or flower-buds, caused by the inaction of the roots and want of necessary food. Another necessary point to be observed in forcing is a judicious supply of water; as a rule, it will be safe to regulate it according to the supply of heat, commencing with a limited supply at first, and increasing it with the increase of temperature, resulting in a full supply every day at the period of blooming. Of course some plants require larger supplies of water at all times than others.



Tillandsia musaica.

introduced into heat after a few weeks establishment in pots, but such as Roses, Rhododendrons, and other hard-wooded plants which have a more persistent system, are absolute in requiring to be potted at least six months before any successful attempt at forcing can be made, so as to allow them to form a season's roots. Having the selected plants properly prepared, the next essential is the manner in which the necessary heat is applied, for any misapplication in this respect will render the previous labour and expense useless, and result in loss and disappointment. The increase of heat should be brought on gradually, so as to resemble as nearly as possible the advances of spring, which forcing is intended to anticipate. It is always better that plants intended for forcing should never feel the effects of frost, however hardy their natural constitution may be, and for that reason they should be early put into a cold frame, at a temperature of not less than 35°; then, according to the time they are required to flower, they may be introduced into a greenhouse temperature of 45°; the length of time they are kept there will depend on the nature of the plants; for soft-wooded and herbaceous kinds a

When blooming, it will be advisable to remove them to a cooler house and supply less water.—“Gardener's Record.”

TILLANDSIA MUSAICA.

As a fine foliage plant of distinct habit and tolerably easy culture, this has but few equals. The broad strap-shaped leaves are of a bright green tint, transversely banded with deep green and brown, or purple, markings, well shown in the accompanying illustration. In its native habitat, it is found growing in moist, partially-shaded situations, at about 5,000 feet above the sea level. It grows nearly equally well on the trunk of trees or in a rich leaf mould, the result of an ever changing tropical vegetation. The plants appear to be exceedingly difficult to import alive, and seed is difficult to obtain, owing to its becoming ripe at the commencement of the rainy season. It requires a moist and equable stove temperature, and succeeds best in a rich compost of Sphagnum, leaf mould, peat, and sand. Mr. Bull was one of the first in Europe to obtain living plants of it, and it suc-

ceeds well in his establishment among other choice foliage plants. The flowers are said to be extremely ornamental, but have not yet been produced in this country. B.

A GOOD METHOD WITH PERSIAN CYCLAMENS.

RAPID strides have been made within these last seven or eight years in the culture of this, the Queen of winter decorative plants. A well managed group of Cyclamens was at one time rarely met with; but since its growing capacity has become better understood, it forms one of the foremost attractions at our early winter and spring floral exhibitions, and in the metropolitan flower markets, where, perhaps, it commands a more ready sale and a higher price than any other plant grown for decorative purposes. It is a valuable auxiliary in establishments when large conservatories or rooms have regularly to be supplied with a numerous assortment of forced plants in pots during winter; and it is indispensable where cut flowers are in demand for vases and bouquets. The sweet-scented kinds are highly esteemed for the latter purpose, and, from the fact of their being of such easy culture, I consider that they are a class of plants well adapted to the requirements of amateurs. Their peculiar mottled foliage, and the long duration of their bloom, render them a never-failing source of interest and pleasure, which is well worth any extra pains that may be bestowed on their culture. From October until Christmas being the dullest portion of the year for flowering plants, I always aim at getting my first batch in at that time. To effect this let them be sown as early in October as possible, in a well-drained pot or pan, previously steeping the seed, which is unusually hard and slow in coming up, in moderately hot water, and placing a pane of glass over the pan, which should then be placed on a shelf near the glass in a warm house or stove, if such be available. Germination will take place in about a fortnight, and the pane of glass must then be removed from the pan to prevent damping off, and also drawing. In about six weeks from the time of sowing I pot them singly into small pots, and replace them on the shelf as before. In the February following I shift them into 48-sized pots, choosing, this time, a compost composed of equal parts of friable loam and dried cow-dung, with a heavy admixture of sharp river sand; I have often tried other mixtures of potting mould, but found none to answer so well as this. From this time I grow them on as briskly as possible until the 1st of May, when they are transferred to a pit or frame, and gradually hardened off, prior to being turned out of the pots and planted about the middle of the month; this, however, must of course depend upon the weather. A north border I find to be the best position to plant them out in. Let the ground be well dug and thoroughly well pulverised, and heavily dressed with rotten manure and plenty of rough sand. Avoid planting them too deeply; keep at least three parts of the bulb well above the surface. I consider this manure dressing to be of paramount importance, providing, as it does, a cool and rich bottom, which is so congenial to the Cyclamen during the hot summer months. A good watering once a week, and a sprinkling with a fine hose or syringe once a day to keep down insect pests, is all the attention they will now require. In the middle of August take them up with a fair amount of soil or ball attached, and pot them in 32's, or Strawberry pots as they are called; use the same compost as that recommended for February potting, and remove them to a pit, paying due attention to watering, shading, &c., for about ten days. By the middle or end of September the pots will be found to be crammed full of roots, when they may be placed in the greenhouse in a position as near as possible to the glass. In adopting this easy method of culture I have been well repaid this winter by as fine a lot of plants for their age as I have ever seen. I formerly sowed them in January and bloomed them in ten months, but I find the twelve months' system the best. My success in this direction has been much augmented by the kindness of Mr. Edgerton, gardener at Strawberry Hill, who some years ago presented me with a selected packet of seed from his famous collection grown at that place. T. P. T.

[We have seen the Cyclamens in the open air in summer, as described by our correspondent, and they were very well and simply grown.]

GARDENING FOR THE WEEK.

Hardy Flowers, Alpine Plants, and the Wild Garden.

The value of our hardy border plants is now duly recognised in the majority of gardens. They are no longer looked upon as outcasts, and as such consigned to some out-of-the-way corner of the grounds, where, in years gone by, they were entirely neglected, and left alone in their struggle for existence. This treatment could have but one result. The weaker plants succumbed; all but a few of the most vigorous and least useful disappearing. What, then, is the best position for an herbaceous border? In olden times, these plants used almost invariably to be arranged by the side of the walks in the kitchen garden, nor have I the least objection to their occupying such a position even now; but the appropriation of such borders to pyramid trees has rather interfered with the olden style. As these have to undergo the operation of occasional root-pruning, it will be obvious that these borders have lost their value for such a purpose, added to which trees interrupt the continuity, which is one of the most important features of a well-arranged herbaceous border. For my part, I prefer a border of this sort to be situated in the pleasure-grounds, with an aspect fairly open to the sun, and not overshadowed by trees. It should be about 8 feet wide, and backed up by a bank of evergreen shrubs. This is a more important point than many people might suppose, and one which it is out of the question to expect where the old kitchen garden arrangement is carried out. There the best backing, and one that used often to be adopted, is a row of Sweet Peas; but a backing of this nature is necessarily of a temporary character, and lacks the repose which a back-ground of evergreen shrubs gives. Even the colours of our most brilliant flowering plants are more effective when seen against a back-ground of those varying shades of neutral tints which are available in our mixed shrubbery. For example, how much more beautiful Hollyhocks appear where they rear their monumental stems, like so many floral columns, amongst the surrounding greenery than when seen against the sky line. There are few places where a border of this sort cannot be formed. It is by no means necessary that it should be straight; a good bold sweeping curve is, in some respects, preferable, as it reduces stiffness and formality, which, if not entirely dispensed with in an herbaceous border, should be a matter of secondary importance. Having selected a border as suggested, the next point will be the character of the soil. If it has been found necessary to invade the lawn all the better, as the majority of these plants have a peculiar liking for fresh soil; indeed, all plants have, unless it be some of our nitrogenous-loving weeds. After the removal of the turf, for which a use is almost sure to be found in any garden, test the drainage, and be sure that there is no danger of any part of the border becoming waterlogged; rather put in an extra drain than run any risk, and let the drains be, if possible, 3 feet, or even more, below the surface, as the roots of all plants, and more especially the class of plants for which we are making provision, are particularly partial to these aerial arteries. The drainage having been completed, and, in the process, the character of the sub-soil tested, a pretty correct opinion may be formed as to what admixture will be necessary. If the soil be a strong clay, I should, instead of removing a portion of the clay and replacing it with good loamy soil, prefer to raise the border, by any addition you may deem it necessary to make, to a height of 12 or 15 inches at the back. Of course there may be exceptions; but, as a rule, herbaceous plants like a tolerably stiff and retentive soil. The front of the border, where the dwarfer and more delicate-rooting plants will be placed, may require some of the sub-soil taking out so as to secure a depth of about 12 inches above the clay bottom. This done, give a good dressing of well-decomposed manure, such as an old Mushroom-bed will furnish; and, if available, an equal proportion of leaf soil, and about a barrowful to every 2 linear yards of border of old mortar or plaster from any old buildings, or, failing that, the same quantity of sand. Dig over the whole to the full depth of soil, so as to thoroughly mingle the materials together; it must then be left loose as dug till the first or second week in March, when it will have settled under the combined influence of frost, snow, and rain, and be in a condition for planting. If the soil be of a light sandy nature, and, as is frequently the case, lying on a gravelly sub-soil, I should strongly advise the removal of a portion of the gravel by trenching, and, if it be at all possible, the use of an equal amount of strong soil, even if at some outlay, and incorporating this with the natural soil—adding manure of a somewhat stronger character than recommended under the previous conditions, and omitting the leaf-mould and the mortar-rubbish as unnecessary in this case. I have presumed that the grassy side of the shrubbery, plantation, or whatever it may be, has been selected; but circumstances may occur in which it may be more convenient to remove some of the shrubs, so as to obtain the necessary width of border. In this case the treatment will be different. Of course my remarks on drainage will hold good, but the

ground must be trenched at least two feet deep; in the bottom of each trench, as opened, 4 or 5 inches of any strong manure may be placed, without paying attention to its thorough decomposition; and as the first spit of soil is turned over on the top of the manure, it should be trodden pretty well down so as to give it firmness. The trenching process being completed, a surface-dressing of materials the same as those previously described, but varying according as the soil may be of a heavy or light sandy nature, should be applied and lightly forked in. In this case the ground having been disturbed to a depth of 2 feet before any planting is done, it will be well, even though a couple of months intervene between the formation and the final planting, to tread the border well over and thoroughly consolidate it, as herbaceous plants like a firm root-hold. Light surface soil tends to surface rooting, and thus incapacitates plants from passing unscathed through even a moderate drought.—JAS. C. NIVEN.

Flower Garden and Pleasure Grounds.

Finish as soon as possible the planting of evergreen and deciduous shrubs and trees, and as soon as this has been done, the soil, if at all heavy on account of the necessary treading upon it during the operation of planting, will probably be found to be in a somewhat consolidated condition; and should wet weather prevail, this may cause accumulations of stagnant water. To prevent this, let it be loosened up with a spade, or, what is better, with a light fork, which will leave it in a loose and friable condition. As previously advised, proceed as rapidly as possible with alterations of all kinds, whether they may consist of the formation of flower-beds and borders, the making of walks, levelling and laying of turf or planting of Box, and other edgings. The planting of hardy herbaceous perennial plants may also be proceeded with, and these plants may be furnished by the reserve garden, or they may be obtained by the division of large and established plants. There are now so many really valuable hardy herbaceous and Alpine plants well suited to this purpose that many of the tall coarse-growing species may with advantage be discarded, as a judicious selection of really decorative plants, well attended to, is certainly more to be desired than a collection of greater extent containing plants worthless as regards decorative effect. A somewhat liberal use, however, may be made with safety of such genera as the *Delphinium*, *Dianthus*, *Myosotis*, *Pentstemon*, *Phlox*, and *Iris*. Wherever it is desired to indulge in the style of gardening known as sub-tropical, the seeds of various kinds of plants used for this purpose should be sown now, in order that they may be had sufficiently strong when the time arrives for planting them out. Such seeds should, of course, be sown in heat in seed-pans, and the plants should be potted off singly as soon as they are large enough to be handled, and grown on as rapidly as possible. They may consist of the various *Ricinus*, *Cannabis gigantea*, *Nicotiana Wigandioides*, *Solanum Warscewiczii*, &c.; while dry roots of the *Cannas*, *Brugmansias*, &c., should be at once placed in heat with a view to increase by cuttings or divisions. Such plants as the *Humea elegans*, so useful for decorative purposes, should be sown in September, and potted off singly during the autumn; they may now require to be potted into larger pots, as, if they are allowed to become pot-bound, they will invariably lose their lower leaves. Pot off also rooted cuttings of choice *Hollyhocks* which may have been inserted during last autumn into pots some 4 inches in diameter; keep them close for a few days, and, when fairly established in their pots, they will only require the protection of a cold pit or frame until the time arrives when they may with safety be planted out where they are intended to flower. Proceed at once to increase bedding stock of all kinds, in accordance with what is likely to be required. Spring-struck cuttings of such plants as the *Verbena*, *Petunia*, *Ageratum*, *Coleus*, *Iresine*, &c., are all much to be preferred to those struck during the previous autumn, which it is advisable to throw away when sufficient cuttings have been secured from them, and such cuttings should be inserted in well drained pots, some 6 or 8 inches in diameter, using a soil composed of sifted leaf soil, and river or silver sand; place the pots containing them in a gentle heat until fairly rooted, when they should be gradually inured to the temperature of an ordinary greenhouse pit, with the exception of the two last-named species, which will, for some time longer, require to be kept in a higher temperature, but in no instance is potting-off singly necessary. Spring-flowering plants and bulbs will soon begin to attract attention, so keep the beds and borders containing them free from weeds and littery matter of all kinds. Remove litter or worm-casts from the lawns by frequent sweeping, and pass a heavy roller over it as often as possible, while the same should frequently be done with gravel walks, in order to render them firm and comfortable. At this season the gravel, when somewhat moist, is apt to adhere to the roller; and, to prevent this, let a faggot of dry wood be burned inside the roller just before using it for this purpose.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Trees and Shrubs.

Push on the planting of all kinds of deciduous trees and shrubs, as the buds are fast swelling, and this kind of work should now be brought to a close as soon as possible. After planting, all should receive a good mulching of half-rotten litter, and, if in situations where the appearance of this is likely to be objectionable, scatter a little fine soil over it, and this will prevent it being blown about. In planting for effect, make choice of elevated positions, and group together plants that are of similar feature, or type, of vegetation, and associate well together. By taking advantage of elevated ground, and planting, on the summit, only trees that grow to a considerable height, and, on the foreground, trees of the same type, but of lower growth, the hills are, as it were, uplifted, and the valleys depressed. Trees should never be planted in a hollow, but on the summit or side of hills. In such positions, they always look more natural, and show off to greater advantage. Planted in this way, they are not only much more effective, but help to bring out any slight undulations in the ground in the most favourable manner. For groups in park scenery, or near mansions in pleasure-grounds, few things are more striking or ornamental than the Scotch Fir (*Pinus sylvestris*). Their bright-looking polished bark is always attractive, and their towering majestic height and form invariably command admiration. The Maiden-hair tree (*Salisburia adiantifolia*) is a highly ornamental tree for pleasure-grounds, and it is singular that it is so seldom met with. Its light green elegant leaves are only excelled by the favourite Fern it resembles, and from which it derives its name. It appears a little fastidious as to soil, as I have never seen it good except on stiff deep land. Although, as a rule, I am not in favour of transplanting evergreens at this season of the year, if the weather continues mild, *Aucubas*, *Rhododendrons*, *Box*, and plants of this kind, that always lift with good balls of earth, may be moved with comparative safety; and there may be special reasons why such work should be done now. When such is the case, those trees that have been so frequently removed as to have induced plenty of fibre, may be operated upon with every prospect of success, provided February and March do not turn out too cold and cutting. April is, of all others, the safe month for transplanting evergreens, and any choice specimens should be left till that time. Of all evergreens, *Rhododendrons* are perhaps the most beautiful; but as it is generally supposed they will not succeed in any other than peat soil, many are deterred from attempting to grow them. The want of peat need be no obstacle to their cultivation, as they will grow in any sharp clean soil that has not been much under cultivation. The best, perhaps, for this purpose, is the trimmings of banks and turf from the side of roads and paths, which contain plenty of sharp grit. The trimmings from the road-side, or any soil that may be used must not contain chalk, or it will be fatal to success. If choice plants are planted, and peat can be obtained at a moderate cost, it is worth while to give them a start in this material. To do this, a hole should be dug large enough to hold a bushel or so, in which the plant will get a good hold, and be independent of the surrounding soil for a year or two. Failing this, leaf soil, about half decomposed, may be used in the same way. In planting, make choice of moderately moist and partially shaded situations, as *Rhododendrons* will not bear excessive drought, and succeed best if not exposed to the full glare of the sun.—J. S., *Wolverstone Park*.

Indoor Fruit Department.

Vines.—Muscats require 5° more heat from the time they are coming into bloom until they are mature than any other sorts. In Vineries where all the shoots have been once stopped, the temperature may be allowed to rise to 85° before giving a little air at the top. No favourable opportunity should be neglected to admit some fresh air, as growing Vines generally stand very much in need of such at this season. Prompt attention must be given to the thinning of bunches and berries on permanent Vines. Those left should be as much equalised as possible as regards size of bunch and the space between each other. The berries on these require to be thinned out more than those in pots, but what number to take out and what to leave must be left to one's own judgment, as all berries do not swell alike, nor will all Vines carry an equal crop. Never allow any pinchings to remain about the house after they are taken off, nor permit the berries to mingle with the soil when thinning. When all have been thinned, the inside border must be supplied with a copious watering. If this can be had at the temperature of the house so much the better. A dusting of guano may with advantage be put all over the surface of the border before watering, and will be washed down about the roots with advantage. Do not rake the surface of the border fine, or the roots may starve for want of water by-and-bye. When *Verbenas* or any other plants that are liable to be infested by red spider are placed in Vineries, a vigilant eye must be kept on them. If syringing be discontinued when the bunches are in bloom, it should

be resumed immediately after the fruit has fairly set. No time should be lost in pruning late Vines, and cleaning the rods and house with as much care as has been exercised in former ones. After this has been accomplished, admit all the air possible, so that the Vines may have that rest before being started again, which the constant firing has hitherto prevented them from enjoying. Any odd bunches of fruit still hanging should not be allowed to interfere with these proceedings, but be cut and stored in the fruit-room.

Pines.—If the soil which it is intended to use for potting these at their spring shift has been outside all winter, protection from wet should be given it forthwith; the corner of the potting-shed is a very suitable cover, and convenient. As time permits, the soil may be prepared for potting. Do not cut the turfs with a spade, or other implement; but tear it asunder with the hands into bits about the size of hens' eggs. This always keeps the fibre entire, which is of much importance with the Pine, especially if the soil is excessively light and sandy. Any of the early Queen pots, which were eased to let the violent bottom-heat escape, should have the plunging material firmly re-pressed around them, so soon as the fruit is up. A uniform temperature at the top and bottom must be constantly supplied to these when the fruit is in a tender state, as it is at this stage that any change or sudden check is more acutely felt than later, when any fluctuation has not so much influence on the future development of the fruit. Other Queens, intended to supply later fruit, should remain in a low temperature; and the drier they can be kept consistently with health, the more certainly will they show fruit when desired.—J. MUIR.

Hardy Fruit.

Orchard trees seldom receive a tithe of the attention they deserve. If, at this season, when pruning, dressing, nailing, &c., is being carried on amongst other kinds of fruit, the orchard trees came in for the same liberal treatment, the results would assuredly be great. Unfortunately, however, it is customary to leave orchards to themselves, and to break through an old-established custom, of however absurd a nature it may be, is invariably a matter of some difficulty. In pruning neglected orchard trees, the endeavour should be made to have every branch clear of its neighbour, and so thinned that, when windy, they do not chafe together. The long and ugly spurs should be shortened back by cutting a few off each year, and in this manner gradually getting rid of all. Lichen and Moss must be cleared off, and, if necessary for its thorough destruction, the stems and branches painted with a mixture of quick-lime and soot. A good dressing of either fresh soil or dung should afterwards be given; and, if digging amongst the trees is impracticable, leave it as a mulching over the roots. If it has not been already done, Raspberries should, at the earliest opportunity, be thinned out; all the old fruiting-canes of last year should be cut away, and the new canes regulated according to the different modes of training; that which is the least laborious and most effective is to have a couple of straining-posts, from five to six feet in height, and well secured in the ground; to these attach three or four strong wires, equidistant, and tie the canes to them; each cane should be distant from the other at least nine inches, and may be shortened back to the same height as the top wire of the fence. It is generally thought that Raspberries are better without manure or other dressing; but this is erroneous, as no other kind of fruit rewards the cultivator more for liberal treatment than the Raspberry. Gooseberry and Currant bushes may be pruned, and the branches of each well thinned out. All kinds are best pruned on the spur principle, with the exception of Black Currants, and these bear the best and the finest fruit on the wood of the previous year, and should be treated accordingly. Birds, and particularly Bullfinches, have now begun their annual work of destroying buds. The best method of reducing them is the gun, and, though by some people its use for such a purpose may be thought cruel, one has to choose, in this part of the country, between this remedy and an absence of fruit. Great diversity of opinion exists as to the best time for pruning Apricots and Peaches. My own opinion is that the moment the buds begin to swell no time should be lost in getting it finished, and the trees nailed and tied to the walls, or trellis, as the case may be. The recent mild weather has brought up the buds of all kinds of fruit, more especially Apricots, and these should therefore have the first attention. Planting all kinds of hardy fruit, when the ground is in suitable condition, should be pushed forward, as it is desirable that such work should be completed early. The same remarks apply to trees growing too freely, which require root-pruning to induce greater fruitfulness.—W. WILDSMITH, *Heckfield*.

Kitchen Garden.

Brussels Sprouts require a considerable time for attaining their full development; and, where an autumn supply is required, if the first sowing was not made last October (which, in many situations, is

a good plan), a box or two should now be sown under glass. As a rule, this vegetable is both sown and planted too late in many places to obtain the most profitable results. Plant out from the seed or nursery bed autumn-sown Cabbages to succeed those planted last September. Stir the soil with a fork between the rows of early Cabbages, selecting a drying day for the operation, and afterwards earth them up. Make a small sowing of Celery, in pans or boxes in heat, for flavouring purposes. Turner's Incomparable White is the best variety for this purpose. When the weather is suitable, and the ground in good working condition, a portion at least of the autumn-sown Onions should be transplanted. In gardens where the Onion maggot is troublesome, it is better to sow the main crop in autumn, somewhat thickly, in a sheltered position, and transplant early in February, or, at least, as soon as the land can be got into a good condition. Select a piece of land that was manured and deeply dug in the autumn or early winter; wheel on a good dressing of charcoal dust, such as can usually be had from the bottoms of heaps where charcoal has been burnt; or, failing this, fall back on the heap of charred refuse reserved when the rubbish-yard was overhauled, spread it evenly over the surface, and rake it well in, or fork it in lightly. Soot also may at all times be beneficially applied. Make the ground tolerably firm, either by treading or drawing the roller over it, and put in the plants, not too deeply, 1 foot row from row, and 4 inches apart in the rows, and a good crop of Onions will be the result. The sooner this is done, if the weather and the ground are suitable, the better, as the plants will be making headway; and, if the maggot should make its appearance, they will not do so much harm as when the Onions are small. If not already done, make a sowing of Veitch's Autumn Cauliflower in pans in heat. This is one of the best for summer use, as it is more capable of withstanding drought than others. Take up the remainder of the crops of Jerusalem Artichokes; select the best for use; place them in a cool cellar or shed, with a little dry sand strewed over them to keep them from shrivelling. In the forcing department every available frame or light will now, or shortly, be brought into requisition, as well as many other contrivances of a makeshift character suggested by the ingenuity of persevering cultivators, and much forethought and attention will be required. In fine mild weather, give as much air as can be done with safety to Potatoes, Carrots, Radishes, Lettuces, &c. Earth up early Potatoes that may require it with light rich soil that has lain in a warm shed a few days to warm. Potatoes with their tops near the glass must be well covered up at night to prevent the frost injuring them. When the early Radishes have all been drawn from amongst the first crops of early Horn Carrots, thin out the latter to about an inch apart, and, in order to fill up all holes, and level displaced soil, sift a little fine rich soil all over the bed, and then water with tepid water (using a rosed pot) all over the bed to settle the young Carrots in their position and hasten their growth. It is at all times necessary to see that all tools are kept in a proper state of repair, and for each man to have one of each kind, such as fork, rake, spade, hoe, &c., for his own individual use, and each man should have also his own place in the tool house, with the necessary hooks or pegs to hang them up, so as to be always ready for use without wasting time in looking for anything he may require.—E. HOBDAV.

COCOA-NUT FIBRE AND ITS USES.

THIS valuable refuse is capable of being used in many ways in garden operations. It is excellent when mixed with sand for propagating. For this purpose I prefer it to leaf mould, the value of which for root-production is, of course, well established. Sand alone is often used for propagating; plants root freely in it, but the roots become too long and tender to do well when they are removed into stiffer soil. When the roots are partially developed in any fibrous substance such a change is never felt, as they are confined to a round portable ball at the base. I have rooted many thousand cuttings in the Cocoa-nut fibre and sand, and I am convinced they took hold of it quicker and with more freedom than any thing I have tried. This applies to having pots filled with it, and also to propagating beds, where a thin layer of it was laid on the top of the flags about the hot-water pipes, and then well watered. On the cuttings being put in, they rooted with wonderful rapidity. Being so open, the heat works freely into and between it, and never becomes sour. As one batch is lifted out it requires to be smoothed over with the hand, and that is all that is necessary before putting in another quantity. One bed of it will root successive batches of cuttings for a whole year without renewal. As a plunging material for propagating or for plants which need bottom-heat, it is equally useful, and it is much longer in decaying than tan or leaves, and is, moreover, cleaner to work in and more pleasant to look at. As a mulching for trees, it is safer and more desirable than tan, or, indeed, than many

kinds of manure, and brings with it none of the Fungi which invariably accompany the use of tan for this purpose. I have seen loam poisoned for plant growing by having tan in a decayed state laid upon its surface. When Hyacinths, Tulips, Narcissus, and other bulbs are potted, they start into growth much more freely under a covering of Cocoa-nut fibre than of ashes or any other matter generally used for that purpose. Bulbs in outside borders show an equal appreciation of it, and it may be used with advantage in mixtures prepared for potting. Soft-wooded stove plants, such as Alocasias, Anthuriums, Marantas, Caladiums, Begonias, Dieffenbachias, &c., succeed well in it. Indeed, it should everywhere take high rank among the requirements for root development, for it can be procured for a mere fraction from nurserymen, or direct from Cocoa-nut mat factories.

J. MUIR

THE KITCHEN GARDEN.

RHUBARB IN LONDON MARKET GARDENS.

OF late years this has become a much sought-for and important vegetable, but half a century ago it was scarcely known in the London market. The late Mr. Myatt, of Deptford, is looked upon as being the father of Rhubarb growers; but his son, the present Mr. Myatt, informs me that Rhubarb was grown in the neighbourhood some years before his father took to growing it, although he was certainly the first who grew it in quantity. The Deptford and neighbouring market gardeners at first thought that Myatt was mad upon the subject; but they soon found out that this was a paying job, though a mad one, and consequently they took to growing it, as also did the majority of the London market gardeners. Now, however, it is almost universally grown, and it is a very accomodating crop, requiring but little care or attention. The varieties grown consist chiefly of the Early Albert, Myatt's Linnæus, Myatt's Victoria, Red Champagne, and Johnson's St. Martin. The last-named sort Mr. Steel has just taken to grow, and it promises well. Mr. Myatt informs me that Red Champagne is much sought after in the market on account of its fine red stalks, and, when forced, its colour is brighter and more imposing than that of other sorts. The soil used for growing Rhubarb is a deep, rich, and moderately moist one, and the position is sometimes in exposed places, and at other times under the shade of fruit trees. The exposed positions are decidedly productive of the finest Rhubarb, hence it may be most desirable to adopt such; but under fruit trees this crop grows almost as well as anything else that could be planted; therefore in order to economise this space, I think few crops pay better than this one. In the Rhubarb season, which is spring, that under the fruit trees grows well, and, as the trees are leafless, they do not shade them much. In sheltered corners, such as are to be found under fruit trees, the produce comes naturally for use about a week sooner than from the open field. In making new plantations, divisions of the old stools are used, and they are planted in rows $2\frac{1}{2}$ feet or 3 feet apart, and from 2 feet to $2\frac{1}{2}$ feet asunder in the rows. No leaves are cut away from them the first year, but the space between the lines is planted with Lettuces or Coleworts. During the second season many stalks are not cut; but in the third year a fair crop is realised. As soon as time can be spared in winter, and before the leaves begin to grow, the ground between the rows is dug over roughly, and a large forkful of rank litter placed over each crown. It would be difficult to take the litter into the plantation on a wheelbarrow, owing to the softness of the newly-dug soil; therefore the workmen carry it in baskets, either on their heads, or, if the baskets are large, in the hand, two people being employed to each of the latter. As a rule, however, some people are employed to fill the round vegetable baskets used; others to carry them on their heads, and a few more to empty their contents over the crowns of the plants. Under the litter the stalks come up clean, tender, and crisp—very much more so than if none were used. The leaf-stalks are pulled for market as long as there is a demand for them, and even in late summer large waggon-loads are often disposed of to jam manufacturers. In bunching the Rhubarb for market, a piece of board, padded with a piece of an old bag, is nailed to the bench in the packing shed, and into it four nails or pegs are driven, two withies being laid crossways for tying. The finest leaves are placed in the bottom, the top and ends being alternate, and over them some small ones, making up the outside again with large stalks, so that the small ones are entirely hidden. Rhubarb-forcing is very simple, and is done in hotbeds covered with hoops and mats. In making young plantations, the sets are sometimes planted about 18 inches apart each way; and, at forcing-time, every other row, and the alternate plants in the row left, are lifted for forcing; old plantations, too, are cleared entirely for forcing. The leaves will be decayed enough to be raked off by the middle of

October, by which time the first portion is usually lifted for forcing. For this purpose trenches are cast out, about 4 feet wide and 2 feet deep, and filled with fermenting manure. Over this a thin layer of common soil is placed, and in it the crowns, after being trimmed of some of their rougher roots, are planted. Over the crowns some loose litter is strewed, and then the beds are hooped over and covered with mats, over which another layer of straw or litter is placed during winter. In the outside covering apertures are made at gathering time, and closed again when done. In February, if the weather be mild, the hoops and mats are commonly dispensed with. In the gardens of Mr. Bessent at Mortlake I have seen some excellent Rhubarb produced in pits, like deep Potato pits, with some heating material underneath, and some loose straw merely shaken loosely over them. D.

Endive.—This vegetable is grown to perfection in the London market gardens, and is ready for use from the middle of August till Christmas. Many growers keep up a supply during the winter and early spring by lifting the plants for winter use and planting them in a frame or amongst sand in a shed, and for spring use from late sowings planted out in dry and sheltered soil. As our markets, however, are so liberally and easily furnished with beautiful Endives from France during the winter, it would not pay the English grower to cultivate them for winter and early spring market. The green curled and the dwarf variety of the same are two sorts commonly grown; but a few of the broad-leaved kinds are sometimes grown in gardens. In the middle of May a sowing is made either in a cold frame or a bed of light soil in the open air, and covered with litter like Radishes. This early crop is commonly planted out on the Celery ridges about the middle or end of June, and becomes fit for use in August. Very early Endives are liable to "run" before they fill up; therefore, earlier sowings than that of May are not to be relied on, and much dependence cannot even be placed on that. A large sowing is made in the open air in June, and another smaller one in July. The plants in the seed bed are thinned out a little at an early stage if thick, and are transplanted permanently in rows about 15 inches apart, and a foot asunder in the rows, between Celery or between summer Cauliflowers, Lettuces, or Cabbages, or in an open field by themselves. Beyond hoeing, no further care is bestowed on them until they have grown enough for tying up, when their leaves are gathered up together and tied round their middle with withies or pieces of matting, like Lettuces. They are kept tied up for a fortnight or three weeks in order that they may be well blanched for market. In September and October the Endives are very fine and abundant in our markets. Mr. Poupart, Mortlake; Messrs. Evans, Dancer, Humphreys, and others, Fulham Fields, are amongst our largest Endive growers.—F.

Exporting the Colorado Potato Beetle.—I notice that the Governments of Switzerland, Austria, and Belgium have adopted stringent measures against the importation of American Potatoes infected with the Colorado Potato beetle. Now, if the wise men of Europe can tell us what they mean by the word "infected," as applied in this instance, I, for one, desire to have them give an explanation. Their entomologists, at least, should know that the beetle referred to does not infect, or in any manner attack, the tuber, but confines itself to the leaves in summer; and the chances of exporting this beetle with the Potatoes is about as likely to occur as sending a cotton planter's "Sambo" with a bale of cotton. Then, again, does not everybody know that this beetle is a native of Texas as well as of the plains to the northward, from whence cotton, buffalo hides, and various other articles have been shipped direct to Europe for the past century, all without once infecting the Potatoes of the Old World? But, for all this, the Colorado Potato pest may be carried to Europe, and become naturalised there; still, it is far more likely to be transported in some other material than among Potatoes, because it is not so stupid as to go to roost for the winter upon a Potato when it can find more comfortable quarters. If the European Governments desire to prevent the introduction and spread of this beetle, let them send over for a bushel preserved in alcohol, and have these mounted and distributed among the farmers, in order that they shall be known and recognised at the moment of their first appearance. Knowledge is power in these matters as well as others, and, had our farmers known the pest on its advent, and cared to destroy it, we should never have heard of Colorado Potato beetles east of the Mississippi River. When these beetles become abundant about our Atlantic seaports, they will no doubt be carried aboard of outgoing vessels, with fresh vegetables from gardens, or even upon the clothes or baggage of passengers; and it would be well for our transatlantic cousins to know them on arrival, in order to bestow a fitting reception. But this beetle neither infects by laying its eggs upon, or in the tubers; neither is it in the habit of crawling into barrels of

Potatoes for the purpose of obtaining a free ride by rail or water; consequently, the excluding of Potatoes from a country as a precautionary measure, as intended in this instance, shows ignorance on the part of the makers of such regulations.—Correspondent, "Moore's Rural."

Kitchen Garden Edgings.—Stevens' garden edging brick, which we recently saw in use in the kitchen garden at Trentham, is by far the best and neatest of any we have met with. Mr. Stevens is doing away with live edgings, such as Box and Ivy, which have been formerly used, and after two years' experience is preparing to replace them by this brick, a light stone-coloured brick of his own design, remarkable for its neatness and durability. Its form admits of its being laid so firmly as to be practically immovable; its colour gives it the appearance of stone edging; and its outline is so simple and neat as to be thoroughly unobtrusive, though perfectly efficient. With an edging of this sort the walks can be kept clean with the least possible trouble by adopting the system of dressing them with salt, which is always a risky experiment when live edgings are made use of. This edging brick is 18 inches long, 5 inches high, and 5 inches wide at the sole, $2\frac{1}{2}$ inches being set above ground. Its great merit is the combination of elegance with durability and efficiency which it presents. This durability, of course, is due to the particular material of which it is made.—"Florist."

Royal Horticultural Society.—The present Council came into office in the belief that their predecessors had exaggerated the difficulties of the society, and that they were sacrificing the Society's interest in arranging with Her Majesty's Commissioners, in consideration of relief from rent and debenture interest (estimated to amount in all to about £5,400 a year), to admit exhibition visitors free. They then adopted the opposite theory, that the difficulties of the Society had not been fully shown to them. My object now, however, is to urge a change which I believe would conciliate country horticulturists, and make them join and support the Society, and one that would not injure the recreation ground of the resident Fellows. This is, to let the resident fellows and those wanting the use of the gardens pay their present subscriptions, and admit country and other Fellow horticulturists to Chiswick at all times, but at South Kensington to shows and meetings only, charging them a guinea subscription. I believe that if this plan were properly worked by country committees, thousands of new Fellows would join, and then the Society would be a national one. Unless some means are taken for bringing about this result, immensely valuable land, bought with the peoples' money, cannot long be allowed by those who are responsible for its use for public objects to continue of the very small public utility the South Kensington Gardens now are.—GEORGE F. WILSON, *Heatherbank, Weybridge Heath.*

THE LATE MR. BUCKLEY.

In your last week's "Obituary" you briefly alluded to the death of our old friend, Mr. Buckley, who, during a period of thirty-three years, was in the employ of Messrs. Rollisson & Sons, for the greater part of which time he held the responsible position of manager at their Tooting nurseries. So intimately was he connected with the botanical reputation of that establishment, that I think a more lengthened notice than that which appeared at p. 82 will be acceptable to many of your readers, not a few of whom must have been personally acquainted with the subject of your remarks. He was born and served his apprenticeship in Lancashire, whence he removed to Woburn, where, under Mr. Forbes, and surrounded by the botanical associations of that fine old place—then noted for its collections of Willows and Grasses—he found full scope for the development of his abilities. Having resided there for some four or five years, during the latter portion of which he acted in the capacity of foreman, he removed to the Tooting Nurseries, where he remained in active employment till seized by paralysis, about twelve months ago. Singularly enough, this seizure was almost simultaneous with that of his friend Mr. Gibson, whom he only survived a few weeks. Endowed with a wonderfully retentive memory and great powers of close observation, and having a thorough love for his profession, he was long admitted to be one of the most accomplished plantmen in the trade. He was invariably willing to impart his knowledge to others, as everyone who has had the pleasure of a walk round the nurseries under his guidance will be ready to admit. Unobtrusive and reticent to a degree on every other point, the mention of any botanical novelty at once touched a sympathetic chord, and the wealth of a well-stored mind was soon revealed. Further, he was a pretty frequent contributor to some of the horticultural periodicals. Mr. Buckley did not marry until late in life, and we regret to say that, owing to his protracted illness, he leaves a widow and three young children almost wholly unprovided for. I sincerely trust, therefore, that some of his London friends may be induced to act on their behalf, and commence a subscription, to which I, for one, shall be most happy to contribute.

Botanic Gardens, Hull.

J. C. NIVEN.

NOTES AND QUESTIONS.

[THE following notes and questions came to hand, or were answered too late for insertion in their several departments.]

Hardiness of *Dracæna indivisa*.—This has withstood uninjured the somewhat severe frost which we lately experienced in the County Wicklow.—T. P. T.

Scotch Fir Seeds.—Will some of your correspondents kindly give me a hint as to the best time for sowing these, and how they ought to be treated?—Hortus.

Wintering *Echeveria secunda glauca*.—Where space indoors is limited for the accommodation of plants of this succulent during winter, they can be wintered equally safe by planting them out on a sloping bank formed under a south wall. A little dry hay shaken over them will afford them ample protection.—T. P. T., *Wicklow.*

A Very Dwarf Mulberry.—The "Revue Horticole" describes a seedling Mulberry, raised by a M. Brun, which is remarkable for an extremely dwarf tufted habit. In three years the stem has not attained more than about 18 inches, while other seedlings of the same batch have in a like period attained a height of 9 or 10 feet.

Williams's Early Prolific Dwarf French Bean.—This is about a week earlier than Sir Joseph Paxton and the Dark Dun, grown under the same circumstances. Last season I used Williams's Bean for my two earliest sowings out of doors, and in each case it was a week in advance of all others.—R. M., *Cheadle.*

Red-skinned Flour-ball Potato.—This is, undoubtedly, the best late Potato in cultivation. It has produced with us this last season a sack of 150 lbs., or 3 bushels, to the square perch, and scarcely a bad one could be found among them. It must be borne in mind that it is a very late variety, and should not be used until the very last, when it will be found to be quite dry and of excellent flavour.—THOS. P. TURNER, *Killruddery, Bray, Wicklow.*

Twisting Pot Vines.—We grow here about a dozen pot Vines for table decoration. The trellis, a simple one, has four upright wires, and is surrounded at the top with a hoop. The Vines are tied round this; and, when they are started, I find the twist to be beneficial rather than otherwise, as every bud starts; whilst others, simply laid down, have not broken so regularly; thus showing that Vines can hardly be twisted too much.—R. GILBERT.

All the Year Round Lettuce.—This is a valuable winter Lettuce. Last January I saw two beds of it in excellent condition. These were about 4 feet wide and perhaps 20 yards long. A wider alley than usual ran between them, and they were raised higher than is usually the case. This, and the soil being a good deal mixed with ashes, gave the plants a naturally dry bed, and one unfavourable to the attacks of slugs.—M.

Geraniums for Indoor Winter Decoration.—Whatever may be said against "hideous miles of scarlet Geraniums," it must at least be granted that the scarlet Geranium fills a gap in the greenhouse at seasons of the year when few other decorative plants are in bloom. I hear from eye witnesses that Mr. Pearson's Geraniums have been a perfect sheet of bloom all through December. My seedlings were very lovely till an accident took place with the boiler, and the frost got into my little greenhouse. There are still some fine blooms out, and, as an artist, I may say that no flower has such a range of exquisite tones of colour as our Zonal Geranium.—F. M.

The Soap Plant (*Chlorogalum pomeridianum*).—This plant, though somewhat rare, can scarcely claim to be classed among the novelties of the current year. It is now six or more years since I saw it growing in the County Cork at Rhin Rhonan, the residence of J. P. Ronayne, Esq., M.P., where it had been established for a considerable time, and was growing freely on a piece of rock-work. When travelling in California some years previously Mr. Ronayne collected and, on his return, carried home with him several bulbs of this plant. I may add that the collection of rock and Alpine plants brought together at Rhin Rhonan is one of the most varied and interesting with which I am acquainted. In the Botanic Gardens here the *Chlorogalum* has been growing for some years, and in one of them, the College Botanic Garden, I had more than once the pleasure of seeing it in flower, so that in these parts, at all events, it is no novelty.—A. B., *Dublin.*

Hotbeds.—I have seen a good many of these; but never one to which it was easy to apply fresh fermenting material without disturbing the plant bed. Is there any easy way of getting the warm manure under the bed?—C. RICHARDSON. [Mr. Groom, Henham Hall, recommends hollow-bottomed beds, which, he says, are in every way superior to such as are solid. The plan which he adopts is to build up corner piers of brick to the required height, say about 18 inches in front and 24 inches at the back, and to lay strong bearers lengthways on these piers, and stout planks crosswise on the bearers to form a floor, leaving sufficient apertures for the heat to pass through. He then sets the frame on and puts into it about 3 inches of leaf mould to keep down the steam; a load of strong fresh dung is now put under the frame, and enclosed with a lining of any sort of litter or garden refuse that may be at hand. In this way the heat is up and the bed fit for planting in less than a week, thus effecting a great saving of time; and the heat may be regulated to a degree. Frames set up in this way are useful all the year round for forcing Asparagus, early Potatoes, propagating bedding plants, for Cucumbers and Melons, and for growing young stock of stove plants during the summer.]

The Large-flowered *Hepatica angulosa* Best.—Let me caution your correspondent Mr. Miles (see p. 82), who intends growing *Hepatica angulosa* in a pot, to be careful to get the large-flowered variety, for there are two. Some years ago, after Messrs. Backhouse had shown their splendid potful of *Hepatica angulosa* at South Kensington, I grew it, and, though hearing of flowers the size of a crown piece, could never produce them much larger than those of the old single blue, though my plants had the true *angulosa* leaves. At last I got some new plants, which, without any trouble, at once yielded very large flowers, and we have since had the two varieties blooming side by side. *Hepaticas* in our bed sow themselves, though we sometimes grow the seed in pans; most of them are single pink flowers, but some of the seedlings are of a deeper and brighter pink than the old single Pink. With us, spring flowers are just coming into beauty; the Christmas Rose and hardy Cyclamens of many colours came first; then *Jasminum nudiflorum*; then the Winter Aconite, then *Crocus Imperati*, and the first of the *Hepaticas*. Mr. Dean's beautiful *Primula auriculiflora* was one of the first of our Primroses; *Lonicera fragrantissima* is just coming into bloom, and *Chimonanthus fragrans*, and *Scilla sibirica*, have only, as yet, produced one or two blooms.—GEORGE WILSON, *Heatherbank, Weybridge.*

New Varieties of Potatoes.—First-class Certificates have lately been awarded by the Royal Horticultural Society to Snowflake and Alpha, the two newest Potatoes sent to England from the United States by Messrs. Bliss.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

DO VARIETIES WEAR OUT?

DR. ASA GRAY has discussed this question with his usual ability. The point, be it noted, is not whether varieties change and break into other varieties that may possess additional vigour of constitution, and supersede existing varieties in the past or present, but whether they die of weakness or old age, and that without modification of form, size, colour, and constitution. Nor must we consider varieties exhibiting abnormal development of any particular part that may weaken them, notably such, for instance, as Wheat with ears of extraordinary length or weight; Mangolds with a preponderating size of root compared with the short tufts of scanty leaves—the types most sought after by cultivators; or Cauliflowers all heads, with little more than leaf enough to bend over and blanch those heads into greater tenderness and spotless whiteness—the form that delights the eyes of horticulturists; but whether varieties with perfectly well-developed constitutions, and all their parts so proportioned as to maintain a normal and healthy vitality, do in fact die out of old age. There are numberless forces tending to drive out the old and to bring in the new; consequently, many of the old varieties are constantly passing away. Take, for instance, garden Peas. Owing to the excitement caused by the present demand for new Peas, and by the many irreproachable kinds now catalogued, many of the old favourites are disappearing altogether or reappearing under new names. Either way the identity of the variety is lost. But will any one affirm that Knight's Dwarf or tall Marrow, or British Queen, or Scimitar, showed any signs of disease, or were touched with the weakness or imbecility of old age? No; these varieties are as good and as vigorous as ever; and such is the case with hundreds of other vegetables, plants, and flowers. Even the Golden Pippin Apple, which seemed at one time to have been given up as hopeless, has never been shown or grown in higher perfection than in the year 1874. It has no sign of decrepitude in leaf, branch, or fruit; and the same holds good of Nonpareils, Ribston Pippins, and other fruits handed down to us from ancient times. Indeed, we find, on looking carefully into the notion that varieties die a natural death, that the idea has been based on a fallacy, thus—individuals die, therefore so also must varieties. On asking for proof, the assumed fact is thus met; with the death of the individual the progeny of that individual perish also; or, in other words, when the parent dies, the children also die. Grant this, and the death of the individual is, as a matter of course, the death of the variety; but one can but marvel that an intellect, like that of the late Mr. Andrew Knight, could ever have found room for such a crotchet—the mere baseless fabric, not of a theory, but of a dream. And yet that he held this view is clear. Dr. Asa Gray quotes the fact from the "Philosophical Transaction" of 1810, in which Mr. Knight propounded the theory, not merely of a natural limit to varieties from grafts and cuttings, but even that they would not survive the natural term of the seedling tree from which they were originally taken. With such views it is no wonder that he proclaimed the sure and speedy decadence of varieties. It could not be otherwise, if his premises were true. The marvel is, that he or anyone could have promulgated a statement so opposed to all history and experience of vegetation. And yet we find Mr. Sisley, who seems to have caught the falling mantle of Mr. Knight in this matter, maintaining that varieties are subject to the same laws of life and death as individuals, inasmuch as they are individuals. If individuals, they are of such a type as to be endowed with the property of life and vigour in continuity. Doubtless individual plants die, though whether really from old age or not is doubtful. The majority of them perish of starvation. The soil is so thoroughly drained of food, their larder swept so clean by the spongioles or feeding points of the roots, that nothing is left to support the plant. Were it otherwise,

I think Dr. Lindley somewhere ventured the opinion that there was no reason, in the nature of the life or constitution of a tree, why it should not live for ever. Trees do live for many centuries, and some writers have expressed a belief that some of the Wellingtonias of California may have waved their proud heads over the far-reaching waters of the deluge. To admit the death of individual plants is one thing; but to base upon this fact the argument that other plants, raised from scions or cuttings of the same plant, die with it, is quite another and a different one. If, as it appears, the theory of the wearing out of varieties is based upon the death of individuals, it must, as a matter of course, be given up. The death of individuals runs parallel with the continuity of varieties, and, in fact, is an element in their stability and perpetuity. Dr. Asa Gray, while contesting the theory of the wearing out of varieties, draws a wide distinction between the stability of those raised from seeds and those propagated by buds, using the term in its widest sense as indicative of all means of increase other than by seed. Fortunately, too, he advances reasons for his conclusions—these are, that cross-fertilisation between the individuals of a species is Nature's mode of increase; that self-fertilised species degenerate; and, that old age brings on debility. Admitting the first, it is not obvious how cross-fertilisation can be a security of stability; for the different varieties of a species are thus apt to be intermingled, and change of type or form is the result of the cross. And, as far as we are aware, Nature has made no provision, physiological or otherwise, to ensure cross-breeding only between different plants of the same variety. As to old age, this argument could only have been started on the assumption that a variety is an individual, and subject to its laws and conditions of weakness, decay, and death—an assumption that Dr. Asa Gray has just disposed of, by showing that individuals, by division, gain an increase, not a loss, of life or vital force. In a word, plants raised from buds are, to all intents and purposes, new plants, characterised by all the energy and force of life that are inherent in those raised from seeds. Further, it is by no means proved that self-fertilised species or varieties degenerate. Analogous instances in the animal kingdom even are not conclusive. Where purity of strain is an object this has been the most frequent mode of perpetuating it; and it is by no means certain that the vigour and longevity of plants have been reduced in consequence. Even if it were so, another statement of Dr. Asa Gray's has assuredly not been proven, viz., that bud propagation is the closest possible kind of close breeding. This, which goes to the root of the matter, is by no means obvious. Propagation by buds is not breeding at all, in the ordinary sense of the word; it is multiplication. Each bud is a plant, as it were, in embryo; detach it from the parent and give it roots, and it is a plant in fact. It has undergone no degeneration, debility, or change of any kind; as it was in the parent, so it is now, with all the powers of the original plant regenerated and intensified by its altered conditions and its closer proximity to the earth. It is conceivable how propagation by seed may either reinforce or lower vital force in plants; but it is not conceivable how bud propagation can be called close breeding, or how similar effects can follow in its train. Dr. Asa Gray quotes Mr. Darwin's brilliant discoveries in proof of his theory that cross-fertilisation—being obviously Nature's favourite mode of increase, is a source of strength as well. The same author's hypothesis of parthenogenesis may be cited to prove that not only each bud of a plant, but each minute gemmule, has the entire potentialities of the plant within it, and may reproduce the whole with an equality of power, circumstances permitting. In the multiplication of varieties from seed, there may be a loss or a gain of vital force; in the multiplication by buds, that force remains constant, provided we propagate from healthy plants. Moreover, the disturbing effects of disease will be more potent in seedling plants than in buds, inasmuch as seedlings are moulded in character and strength by the plant as a whole; whereas buds are local centres of vitality, each with its own individuality, so that one bud may be strong, another weak—one healthy, and another diseased, when placed side by side. Hence, by the careful selection of buds, and the use of those of normal strength and vigour, the variety is perpetuated with such certainty and constancy that not only is there little, but no perceptible change at all, on this score from

"the mills of the gods that grind so exceedingly slow" within the limits of our human experience. Within range of horticultural history, varieties cannot be said to have died out from sheer lack of vital force, weakness, or age. As to changes following in the track of alterations of climatal conditions and geological development, that is another and quite a distinct question that hardly affects the present enquiry. D. T. FISH.

FORCING ROSES.

THOSE who have to lift their plants from open borders after this time of the year, must not expect many flowers, if any; but rather aim at getting a good early growth, that they may have a supply next winter. Had the plants been potted early in November, they might have been forced into flower in April, and would have been in good condition for starting in November following. Select good vigorous plants from the borders, take them up with all the roots possible, prune them down to one or two buds, and pot them in 10-inch or 12-inch pots, cleanly but not too deeply crooked, using a good friable loam and a little sand, and for Teas and tender-growing sorts generally, rich leaf mould may be added. After potting, the plants should be watered and stored in a cold pit or house, where it is only necessary to exclude frost, till about the beginning of March. At this date they may be started in a very gentle temperature of about 45° at night and from 50° to 60°, or 65°, by day, according as the weather is cold, dull, or sunny. The plants must be kept near the glass and well exposed to the light, taking care at the same time to admit air freely at all times, consistently with the proper temperature and the avoidance of draughts; in fact, they may be treated like late Peaches generally. Where the shoots are too thick, or crowded, they may be thinned out; greenfly must be kept down by frequent gentle smokings with tobacco-paper and syringing, and mildew by slight dustings of flowers of sulphur. Water must be liberally supplied to the roots as growth progresses—at no time should they be allowed to get parched; but liquid manure will not be required for plants so recently potted in fresh soil. The strongest shoots may be pinched to equalise the vigour; but, as a rule, pot Roses, grown for flowers and not for exhibition, require little attention other than watering and keeping clean. By the beginning of June they may be turned out of doors and plunged in ashes on a south or west border. Here they will require watering only, and any blooms they make, either before or after this date, should be pinched off. By September, though the points of the shoots may be green, the wood will be ripe enough at the base, and the plants should be pruned to one or two buds; and before frost sets in they must be moved into a cold house until they are wanted. Whether the plants have been bought or prepared at home, the directions for forcing are the same. Like most other plants grown for forcing everything depends on the preparatory treatment above described. Early ripened and early pruned Roses force easily into flower. Force gently, ventilate regularly, keep the plants clean, give them plenty of light, and make the most of sun heat; 45° by night, and from 50° to 55° by day, is a high enough temperature at first, till the buds are about an inch long, when 5° may be added to these figures. When the buds appear, the night temperature may be raised to 60°, and it may go up to 75° with sunheat, and these temperatures should not be exceeded during the winter and early spring months. Later in the season, when the days are longer and finer, and when more air can be given they will stand, and even be benefited by, a much higher temperature; but earlier batches should not be pushed too hard where a healthy growth and good foliage, upon which the next year's success depends, is desired. When the plants have done flowering, and have to be moved to make room for a succession, they must not be forgotten, as they often are, for it must be borne in mind, that on their treatment after this date the next year's supply of Roses depends. From this time they must be treated to an airy summer temperature, and carefully watered—occasionally with weak liquid manure—till about the beginning of summer, when they may be set out of doors and plunged in ashes as before; but this time behind a north wall, as plants forced early are only too disposed to come away before their time, and the object is to keep them back. The bottom buds will, however, not break till they are pruned, which should be delayed till September, and afterwards they may be treated as in the year previous, only that before forcing the surface soil should be removed from the pots and a rich top dressing given, consisting of good loam, well-rotted cowdung, and a little bone dust. When the plants get weak after a few years' forcing, they may be restored to the border again, and their place filled with fresh plants. By following this practice, and always forcing the earliest first, a continual succession of good plants may be kept up.

J. S.

NOTES OF THE WEEK.

— A BEAUTIFUL variety of *Narcissus Tazetta* has become naturalised in many parts of Cornwall, and is just now flowering profusely at St. Michael's Mount and elsewhere in that county. Through the kindness of Mr. Tyerman, who has sent us fresh specimens of it, we find that it is a variety often met with in gardens under the name of *Luna*. The scape bears from six to eight flowers, which are of snowy whiteness, with delicate pale lemon-coloured cups. If any of our readers who may be staying at Mentone or Nice would favour us with specimens of *Narcissi*, which will now be blooming freely at both places, we shall be greatly obliged.

— TREE FERNS are nearly all of elegant and pleasing habit, and one deserving these epithets in a high degree is *Cyathea insignis*, a native of Jamaica and other West Indian islands. A magnificent specimen of this species recently attracted admiration in the tropical conservatory at Kew. It has fronds upwards of 12 feet in length, the stipes or stalks of which are densely clothed with long glossy scales.

— M. VAN HULLE writes to us to say that some seeds of the *Victoria regia* and *Euryale* were kept in a dry place ready to show to visitors who might be curious to inspect seeds of these aquatic plants. These seeds had remained dry all the summer of 1874; but about a month since one of the workmen threw them into a glass of water, where the *Euryale* germinated, and has gone on since growing satisfactorily. Here, then, is an instance of *Euryale* seed preserving its germinating powers, without water, during an entire season.

— THE laying out of that portion of the Thames Embankment which lies between Outram's statue and Whitehall Gardens is being rapidly proceeded with. Within the last week or two, a large number of beds have been formed and heavily manured; the foundations of many of the paths have been put in, and a very considerable number of trees planted. The portion of land on the west side towards Whitehall, which was reserved by the Crown when the first arrangements with the Metropolitan Board of Works were made, has been partitioned off, and the Crown has undertaken to erect an ornamental wall at the western boundary of the garden, which, it is expected, will be opened in May next.

— MR. TYERMAN, of Penlee, Tregoney, Cornwall, has sent us some twenty or thirty species of outdoor flowers in beautiful condition. Among the most striking are *Narcissus minor* and *N. Tazetta*, two varieties of *Anemone coronaria*, *Iris stylosa*, and the rich purple and yellow *I. reticulata*; *Saxifraga crassifolia*, several kinds of Grape Hyacinths (*Muscari*), *Habrothamnus fasciculatus*, *Veronica Andersoni variegata*, *Cytisus fragrans*, *Triteleia uniflora*, *Grevillea rosmarinifolia*, New Holland Daisy, known in gardens as *Vittadinia trilobata*, and others, now flowering in the open air in that county.

— IN the current number of the "Botanical Magazine" is a coloured figure of *Senecio macroglossus*, a large flowered scandent species, closely resembling the common Wood Ivy in its habit of growth. The flowers, which are eight-rayed, are about 2 inches across, and of a clear yellow. Dr. Hooker states that it is the largest-flowered species of the extensive genus to which it belongs—a genus which contains nearly a thousand species, of which our common Groundsel (*S. vulgaris*) is a well-known example. In point of size, however, we are inclined to think that the beautiful purple-rayed, golden-eyed *S. pulcher* ("Bot. Mag." t. 5, 959), introduced to our gardens by Mr. J. Tyerman, of Penlee, Tregoney, is still larger, and certainly far more showy. *S. macroglossus* is similar in habit to *S. mikanioides* (German Ivy), a plant largely used in Germany, Russia, and America, as a pot plant, and for training around the cornices of apartments.

— A LECTURE on Fungi in relation to disease was delivered on Wednesday evening last by the Rev. M. J. Berkeley, in the council room of the Royal Horticultural Society at South Kensington. The lecturer explained the many theories advanced by medical men and Fungologists in relation to the cholera and other diseases, and pointed out that a national school of scientific research is much to be desired in this country, on the same plan as those in Germany and elsewhere. The reverend lecturer alluded to the fermentation which takes place in flesh wounds, and stated that in many cases this fermentation or decomposition is due to the agency of Fungoid spores, which are so minute as to be borne to any part of the globe by the slightest breeze; hence the use of cotton-wool or other covering to exclude these atoms, and the great care which is now taken by surgeons to disinfect their amputating implements with carbolic acid before performing any operation. In conclusion, Mr. Berkeley alluded to the baneful effects of the Ergot of the common Rye, which, if administered during failing health, has the singular property of causing the human body to become ulcerated in a very alarming manner, and cattle not unfrequently are injured in a similar way by eating Rye Grass affected by this Fungus.

THE FRUIT GARDEN.

MELON CULTURE.

(THE AFRICAN MELON.)

WE adopt the same routine of cultivation both in pits and houses, and all varieties are treated alike, with the exception of the African kind, which is distinguished from all others by the size of its fruit and foliage, and which requires rather more space than any of the others. Our Melon-house, from which we generally get our earliest and latest crops, is heated by means of a flow and return pipe on each side. It is a low, broad, span-roofed structure, in which there is a central bed 6 feet wide, and side beds 3 feet wide, each bed being furnished with a flow and return pipe for bottom heat when required. We only take one crop from each set of plants, as I never could see any advantage in keeping them longer. When preparing for the plants, we fill the beds, nearly level with their tops, with fermenting stable manure packed very firmly, in order that it may give a gentle lasting heat, which is supplemented by that from the hot-water pipes, whenever it falls below 85°. On the fermenting material we place a layer of turf from an old pasture, and on that about a foot in thickness of the same material roughly chopped up. This is rammed down as firmly as mallets and rammers can do it. As soon as the soil is thoroughly warmed, we plant one healthy young plant under



Sir S. Baker's African Melon contrasted with Scarlet Gem.

each rafter, and support it with a stake, until it reaches the trellis, which is about 15 inches from the glass. Under a brisk moist temperature, the plants quickly attain the desired height, when they are stopped, and the side shoots trained out horizontally. They soon afterwards show fruits on every shoot, about a dozen of which are allowed to set, care being taken to secure a somewhat dry atmosphere until they commence to swell, when five or six of the best should be selected and the rest removed. At this stage of their growth we always top dress the beds with loam and a little decayed pigeons' dung. While the crop is swelling we give tepid water in abundance, as, if Melons are once allowed to get dry, they are permanently injured; but as soon as they show signs of ripening, water is withheld and a dry cool atmosphere maintained. Green or white-fleshed kinds are the favourites here, Gilbert's Improved, Victory of Bath, and Green Fleshed being excellent varieties and heavy croppers. I may mention that the African variety produced fruits each weighing from 8 to 18½ lbs., and that the average weight of fruit produced by each plant of other sorts has been 24 lbs., or six fruits of 4 lbs. each. As we only grew the African kind as a curiosity, we limited the number of fruits on each plant to three, so as to see what size they would attain, and they hung on the plant quite a month after they were

fully ripe. The universal opinion of all good judges of Melons is, that this variety might successfully compete, both for size and flavour, with any other in existence—even in this exceptionally favourable season for Melons. JAMES GROOM.

Henham Gardens, Suffolk.

THE QUEEN PINE-APPLE.

IF the St. Michael Pines continue to arrive annually, and in increasing abundance during the autumn, winter, and spring months, it is quite evident that Pine-growing in England during that period may be discontinued, except where it is carried on for the pleasure of the thing, for the St. Michael Pines are much larger and better than the general sample of home-grown winter fruit, and they can be bought cheaper than the latter can be produced, or at least as cheap. Should this happen, our Pine-growing will be confined to the summer supply, and by preference we shall have to fall back upon the Queen, as this is now so well adapted for early forcing, and, as regards appearance and flavour, is undoubtedly one of the very best. Unfortunately the Queen has got a notorious reputation for being a shy fruiter, or, rather, missing to fruit just at the time it is wanted—a character which I am sure it does not deserve, for, according to my uniform experience it is one of the most certain in this respect. Where it behaves otherwise it must be due to the treatment, and is not the plant's fault. The Queen deserves a good character from me at least, for during the last nine years I have grown about thirty fruiterers annually (never more) of that variety for a special purpose in summer, and it has never failed to "show" at the desired time. Sometimes one or two plants miss, but, as a rule, nearly the whole fruit yearly at the same time. I have been a frequent exhibitor of Pines at the summer shows in different parts of the country, and I have always had Pines for the purpose while watching the supply for the table at the same time, and not unfrequently have had as many as from six to nine fruits out at once for exhibition. I merely mention this to show that my limited number of fruiting plants must have come up to time, or I could not have done as much. On several occasions I sold seven or eight of these fruits for 21s. each, after they had been some days exhibited, as they were not wanted at home. This season we started the half of our Queens in December, and not one in the row has missed, whilst the remaining few look as if they would bolt also when wanted. What can be accomplished with a dozen plants can also be done with a hundred. I attribute my success in getting the plants to throw up so surely to firm potting, and getting well-ripened plants by autumn in the first instance, but chiefly to starting them gradually, as regards bottom-heat. I am so confident that a sudden rise in the bottom-heat—say, from 65° or 70° to 90° at once—will cause a miss, that I would undertake to make the best batch of Queens I ever saw, or most of them, miss fruit by such treatment, unless the fruit-buds were almost in sight. Here, our Queens never experience a bottom-heat below 70° and it is only so low for one month. When started, it is raised very gradually to 75°, and this is never exceeded till the fruit is fairly up, when it is slowly pushed on to 82°, and this figure is never exceeded by fire-heat. It will be perceived that, in this practice, I am simply following the usual rule laid down with regard to Vines and other fruit. No one would think of starting Vines at a summer temperature at first. With Peaches such treatment would be considered madness, with forced Strawberries it would be ruin; and the same may be said of other plants. Why, therefore, Pines should be made an exception I cannot see; but it is so, for a jump of 20° of both top and bottom-heat at starting time is the general practice. Only lately I saw it recommended to start, at a bottom-heat of 90°, and a maximum top-heat of 85°, Queens that had been at rest the week before at a temperature 20° or more below these figures. The writer had much to say about Queens missing, and no wonder. Nature affords no parallel for such treatment, and both practice and theory prove it to be wrong. The theory practically inculcated by all good Pine growers is that the embryo fruit bud is perfected with the close of the summer's growth before the plant goes to rest, and that when the plants

are started the fruit shows itself with the first indications of growth. This, I apprehend, is the meaning of the oft-repeated advice, "get the plants well matured by autumn, and choose the best-ripened and thickest-necked plants for fruiting." If the fruit is not there we cannot get it there until growth is again checked by severe and unnatural means, to which gardeners never resort if they can help it. Now, assuming this theory to be correct, viz., that the embryo fruit bud is matured in autumn, what treatment is most likely to promote its healthy development when the plants are started—a sudden acceleration of temperature or the reverse? According to physiologists it requires a higher temperature to bring plants into leaf than into flower, and when they are hurried in the earlier stages of growth it is at the expense of the crop of fruit. This all gardeners know to be the truth in the case of fruit trees, as in the Peach and Strawberry already mentioned, and that the same law holds good with the Pine there can hardly be the least doubt. If it requires as high a temperature to start it as it does to swell its fruit, it is an exception to all other plants; but that it is not so I am satisfied from the experience above recorded. Some years ago I was in a garden where some hundreds of fruiting Pines were grown, and the gardener complained grievously of the number of "misses." Quite two-thirds of his plants had missed, and he believed in a "smart bottom-heat to begin with." His Queens, both the first and second lot, had been started some three or four months, and looked as if their fruiting would continue to be a matter of expectation for ever. It is a serious misfortune to a gardener when a batch of Pines is lost in this manner, and any explanation that can be thrown upon the subject will, no doubt, be welcome.

J. S. W.

SHANKING OF GRAPES.

THIS disease is very general amongst Grapes. It is the very worst of all the affections to which Vines are liable. If attacked with any kind of insect, even by the Phylloxera, mildew, or any other pest, the fruit can usually be made use of in some form or other, but when the disease is shanking it is utterly worthless. Some think their Grapes are shanked when they are not; others, who would fain escape the fell destroyer, think shanking has not set in when it has. I have often met with amateur Grape growers who could not understand how many of their Grape berries, when apparently ripe, were found to be quite sour; these were shanked. Shankd fruit is easily known; but that the disease may be the more readily detected, I will briefly describe the unmistakeable indications of it. The stalk of the berry first becomes yellow, then brown, and lastly quite black and wiry. This is seldom confined to a single berry—it begins at the point of the bunch which it ascends. Sometimes only a shoulder is affected, and in that case it can be cut away, leaving the remainder sound, but in general it affects the whole bunch; after the stalks blacken, the berries shrivel to a greater or less extent, when they undergo a fermenting process which makes them sour and more unpalatable than when quite green. It rarely shows itself until after the berries are stoned and have started to swell a second time; but after that it may appear at any moment, even when the fruit has hung for a long time quite ripe. The first crop on young Vines sometimes shanks, but the evil is more generally confined to old ones which have been planted out for many years. The future well-being of young Vines is very doubtful when shanking appears among their fruit, as, if once attacked, the disease usually returns afterwards, unless curative measures are at once taken. I have often observed that early and quickly-ripened Grapes do not shank so much as late ones that hang long before arriving at maturity. I have indeed rarely seen a shanked berry in Grapes ripe in May or June. This I consider to be owing to the warmth applied to the roots of early Vines, a fact which appears to afford proof that a cold state of the roots is the primary cause of shanking. It is about the month of October, or sometimes earlier if the season has previously been wet, that shanking begins to show itself, and this is the time, just before winter protection is put on, when the outside borders become excessively wet, and consequently cold. I venture to think that if Vine borders were protected earlier, and more generally, there would be fewer shanked Grapes. It is before the borders get saturated with autumn rains that coverings should be applied, i.e., when the soil is dry and warm. Cultivators are generally particular about having their early Vine borders not only protected above, but also supplied by heat from underneath, and this until the fruit is fully ripe. Why, therefore, should not the same care be taken in the case of autumn borders. I do not mean

that the soil should be heated artificially, but simply that it should have such protection as will keep the outside roots at the same temperature as that in which the stems are inside. Badly drained borders are in no way different from those exposed to cold rains in an unprotected state. Such borders are never dry, either in autumn or winter, even when covered early in the season. Some attribute shanking to over restriction in the way of foliage, but that I imagine is a mistake. Then again it is well known that shanking seldom affects Grapes produced early by Vines in pots. These are as much restricted in their growth as any Vines could possibly be. With such evidence before us, it is likely that a cold damp state of the soil about the roots is the cause of Grapes shanking. The preventive therefore is well-drained borders and early and thorough surface mulching.

J. M.

BOUGHT VINES BETTER THAN HOME-GROWN ONES.

I CAN assure Mr. Churchill that my statement (see p. 45), that many skilful Grape-growers fail to grow their own pot Vines successfully, is correct—a fact of which I have had ample proof. I can see nothing discreditable in gardeners buying pot Vines at establishments in which their culture has been made a speciality, and in which, on that account, they are able to grow them better than is generally done in private places. In speaking of cutting Grapes from pot Vines in April and May, and giving the total cost of two dozen fruiting pot Vines at £21, does Mr. Churchill imagine that he is proving the buying of pot Vines to be an expensive affair? He is correct about the cost; but, as he is silent about remuneration, perhaps you will allow me to supplement his calculations with reference to that matter. It is not the original cost to which I look for the value of an article, but to the actual worth of the produce. New Grapes are valuable in April and May. The poorest fruiting pot Vine will bear at least 10 lbs. of Grapes, which at the very lowest price are worth 10s. per pound. This brings the return for the £21 to £120; and, deducting the "trade" price (£99), a good sum is left to cover the sundry expenses. The principal expense in forcing winter Grapes is the fuel; but, as a rule, the pot Vines are grown in spare corners of structures heated for other subjects, which would generally otherwise be empty; therefore the cost of firing cannot be wholly charged to the pot Vines. The weights of the Elvaston Castle bunches are doubtless correct; but I may inform your correspondent that I know a trade grower who is in the habit of fruiting the weakest of his canes after his regular customers have had their pick, and yet he cuts bunches from them weighing 3½ lbs.

J. MUIR.

Mr. Muir is wrong in saying that gardeners in private establishments cannot grow pot Vines as well as nurserymen can. I have a quantity now of last year's growth from which I expect our earliest Grapes in April. Some of them only struck from eyes last spring are showing ten and twelve bunches each; others, two years old, have shown as many as twenty bunches. These canes, I was told in July last by a trade grower, were being kept too damp, a statement to which I replied, "come and see them in April," and I hope he will do so. I trust that Mr. Gilbert will give us his experience on this subject; and, as Mr. Muir has cast the first stone at us private growers, let us show him that we can produce as good pot Vines in our own quiet way, as the nurserymen can do in their mysterious fashion.

WM. IRVINE.

Glossop Place, Manchester.

FOREIGN AND ENGLISH GROWN PEARS.

THE large Channel Island dessert Pears shown at Kensington and other places have given rise to the question of the comparative quality of this fruit and that grown in England. This point is frequently mooted by those who see both at the exhibitions, and who read such conflicting statements respecting them in the gardening papers, and the question scarcely admits of a positive reply as regards all the varieties usually grown in England and France or the Channel Islands. Some of the largest varieties, such as Duchesse d'Angoulême, Beurré Diel, Chaumontel, and Van Mons Léon le Clerc, are better in texture and flavour when grown in France or the Channel Islands than when they are grown in England. But if we come to the smaller varieties—for instance, Marie Louise, Louise Bonne of Jersey, Seckle, Doyenné du Comice, Winter Nélis, Comte de Lamy, Joséphine de Malines, Thompson's, Brown Beurré, Knight's Monarch, and others, I make bold to assert that these, which may be taken as representatives of the best Pears in existence, are of better quality when grown in England than any produced abroad. This is not a hasty conclusion formed upon insufficient data, but upon extended practical experience,

close observation, and comparison, not of a single locality, but of the produce of many parts of the kingdom.

Judging Pears.

I would observe that, although we hear so much about the influences of climate upon hardy fruits in the different parts of England (and I am ready to admit that its effects are great), yet these climatic influences upon the quality of the fruit of the Pear are not nearly so great as that produced by the difference in soils; and it is to this difference that I attribute the superiority of the best English-grown Pears over any produced elsewhere. From the finer appearance on the one hand, and superior quality on the other, it becomes a somewhat difficult and unpleasant duty to judge between the home-grown and these foreign Pears on the exhibition table; and it would require a great deal of moral courage on the part of the judges to give the preference to quality over size and general appearance. I maintain, however, that these collections of large coarse Pears have no more right to take precedence of smaller fruit of finer texture and better flavour, than Trebbiano and Barbarossa Grapes would have in being placed before Muscats and black Hamburgs. It would, I am sure, be a positive infliction, even to an indiscriminate lover of fruit, to be compelled to eat these grand-looking, coarse-textured, flavourless examples of Beurré Clairgeau, and others which are little better, upon whose appearance alone the awards are made. The sooner the matter is looked at from a common-sense point of view the better; for it is difficult to see why one standard of excellence should be correct for all kinds of dessert fruit except the Pear, for which another and new one has to be adopted, unless fashion alone is leading us astray. When such things as these enormous cooking Pears, Uvedale's St. Germain, looking like Swede Turnips, are made to do duty on the occasion of large dinner parties, it is not easy to foresee the end. Fine-looking coarse fruit may be tolerated at exceptional times; but if a gardener were to send it on ordinary occasions to his employer's table, he would most likely have them consigned to the pigs, and the trees that produced them removed. From the day that appearance is preferred to quality at our fruit shows, these exhibitions will cease to promote the real advancement of fruit culture. No wonder that the complaints of exhibitors of the splendid collection of English grown Pears seen at South Kensington were loud at being compelled to show against the Channel-Island-grown fruit; they naturally felt that they were labouring under an insurmountable disadvantage in climate for producing fruit so fine in appearance, but were aware that their own were greatly superior in edible qualities, which unquestionably should command the preference. I looked through the exhibition in vain for that finest flavoured of all Pears, the Seckle, and could not meet with a single dish—the exhibitors evidently being under the impression that its small size would count against them; yet I well recollect the time when for single dishes this variety had a separate class made for it, no other sort being able to compete with it in flavour. With few exceptional varieties, Pears when grown large are not so highly flavoured according to their respective kinds as when they are small or moderate in size. This I have repeatedly proved in different soils and widely separated localities; in seasons when such sorts as Louise Bonne, Marie Louise, or others of fine quality bore only a thin crop, and were consequently much larger than when the trees were heavily laden, the fruit from the same trees bore no comparison for high flavour in the large as compared with their smaller state. The question has lately been asked as to the comparative flavour of fruit produced on walls and on standard trees. An answer to this requires to be somewhat qualified. In some parts of England, more especially in the north, a particular variety will succeed well on a wall; but not as a standard. For instance, the excellent Pear Passe Colmar does well in some situations on walls, but the fruit is poor, gritty, and liable to crack on a standard. In localities where varieties of the best quality will do well, both on walls and as standards, the fruit produced by the latter, although generally much smaller, is far better flavoured. This I have invariably found to be the case in different parts of the country.

Best Kinds of Pears.

In planting Pears, very great mistakes are generally made by trying too many varieties, especially of such kinds as ripen in the autumn. It is no uncommon occurrence to find, even in well managed gardens, four times the number of sorts necessary, all ripe during the latter part of October and November, and when Christmas comes there is a scarcity. Winter Nélis is one of the very best Pears in cultivation—tender, juicy, and finely flavoured, coming in when Pears begin to be scarce, about the beginning of the year—and with good management will afford a succession for six weeks. The tree has an excellent constitution, is a free and regular bearer (in this it has few equals), and will do well on a wall in almost any part of England,

where Pears can be fairly grown; and yet, with all its good qualities and the price it commands, it is seldom met with. It is one of the very first fruits I should recommend for planting on the cottagers' gable or the walls of a farmhouse; in fact, I know cottagers whose single tree goes a long way towards paying the rent. Where this Pear will succeed as a standard it should be largely grown for market purposes; and where Pears or any other fruit are grown for sale, the best course to follow is to confine oneself to a few kinds that possess the properties of a healthy constitution, a free disposition in bearing, good quality in the fruit, and if in season when the market is not overstocked with numerous varieties, it will be all the better. As I have repeatedly urged, if there be one thing more than another in rural economy that we lack, it is the extended culture of hardy-fruit. So far as the farmer and cottager are concerned, except in the principal Apple-growing districts, the south of the kingdom is far behind the north in the attention paid to this important branch of industry. Amongst the smaller and more numerous holdings in the northern counties, notwithstanding the disadvantages of climate, the orchard is looked upon as of more importance, and is less frequently absent than in the south. The six following kinds of Pears I should recommend for planting largely:—Williams's Bon Chrétien, a good Pear, and free bearer; Beurré de Capiaumont, a good melting sort, and an immense cropper; Marie Louise, a Pear that for general excellence is not surpassed, will grow and bear well over a wide range of the kingdom, doing well as a standard even in the northern counties; Louise Bonne, of Jersey, equally good in every way, but smaller fruit than the last; Winter Nélis, already described; Brown Beurré, one of the very best late Pears, a good grower and free bearer, but will not succeed as a standard in all parts of the country.

Apples.

The following are half-a-dozen Apples that for free bearing and general excellence cannot be surpassed: Lord Suffield, a large, good, early, and free-bearing kind for cooking, and one that will succeed in any soil or situation where Apples will grow at all; Blenheim Pippin, large bearer, and one that keeps well, and excellent alike for dessert or culinary purposes; Dumelow's Seedling, large-sized fruit, heavy bearer, good keeper, and one of the best cooking sorts in existence; Cox's Orange Pippin, a most excellent dessert Apple, a good keeper and free bearer; Yorkshire Greening, an excellent culinary Apple, free bearer, and fair keeper; Alfriston, one of the latest keeping culinary sorts, large, a good bearer, and excellent. The season for planting is fast drawing to a close. The situation selected should, if possible, be fairly sheltered, otherwise the bloom is more likely to suffer through spring frosts, as also the fruit by strong winds. The soil should be of fair depth and medium consistency—neither too heavy nor too light; of the two extremes the latter is the worst. There must be no stagnant water in the soil; consequently, if wet, it must be drained. A moderately open sub-soil is the best. If of fair quality, the ground should be trenched eighteen inches deep. The application of manure in the preparation of the land has been recommended by some writers; but no one who has had practical experience in the cultivation of these fruits is likely to advise such a process. Land that requires manure in the preparation for planting Apples and Pears is not fit for growing them, and consequently, should not be turned to such purpose; the greatest difficulty experienced in the cultivation of these fruits in private gardens where culinary vegetables grow is with the manure the latter receive, which induces over-luxuriance in the trees.

T. BAINES.

STRAWBERRIES IN LONDON MARKET GARDENS.

THE Strawberry is very largely cultivated around London, some hundred of acres being annually devoted to its growth. In the Fulham Fields but very few Strawberries are grown; indeed, Steel, Bagley, Humphrey, and other large growers in that fertile level, do not grow a single plant. The finest fields of this fruit that I have seen are at Isleworth, Twickenham, Acton, Deptford, and Chiswick; but, in addition to these, there are many small fields of the same all around the metropolis. Kent is famous for its Strawberries; and gardeners in that county, living several miles from London send heavy consignments of this fruit to the Borough and Covent Garden Markets. Unless the soil is suitable for this crop, market gardeners deem it more advantageous to devote their ground to other vegetables and fruits that are likely to be more remunerative. A good sandy loam, rich and moderately moist, is considered the best, as one that is high and dry is liable to become too parched by the summer's drought to ripen a good crop of fruit, and in a tenacious loam the plants are short-lived, and not very satisfactory. The varieties grown for market purposes are very numerous, every grower having his own chosen sorts; but the following are universal favourites:—British Queen and Myatt's variety of the same,

Myatt's Eliza, Mammoth, Eleanor, Keen's Seedling, Old Pine, Dr. Hogg, Double-bearing, Elton, Kitley's Goliath, President, Sir J. Paxton, Sir Harry, and Spring Grove. Many of the gardeners have kinds saved from their own plantations for a series of years, and these have local names; in fact, a good deal of confusion exists respecting the nomenclature of Strawberries in market gardens. One of the greatest recommendations that a punnet of Strawberries in a fruiterer's shop-window can possess is to have the prefix "Myatt's" attached to its name. As soon as the fruit is picked from a plantation, the best of the young plants on the runners are selected for forming a new field, the runners being severed from the parent plants with the spade, so as to make the young plant solely dependent upon itself, but permitting it to remain otherwise undisturbed till a fitting time arrives for its final transplanting; or the young plants may at once be taken up, planted permanently, or in nursery lines, to await a convenient season. This separation of the young offsets sometimes takes place in August, but more commonly in September, and, indeed, it is often delayed till October, when the spaces between the rows are about to be dug over and planted with Cabbage Lettuces. Having prepared the young plants, the ground for their reception—having been trenched and exceptionally well manured for the previous crops—is now dug; and, if need be, re-manured, or the ground is sometimes manured and trenched immediately before planting. The ground being level, lines are marked across its surface 18 inches or 2 feet apart, and the Strawberries planted 18 inches asunder in the rows. Two feet is, as a rule, the recognised distance, especially for strong growing sorts, such as the British Queen, and, in some instances, an additional 6 inches is added to the last distance. Mr. Myatt, of Deptford, in making some of his plantations, lines off his ground lengthwise and crosswise in rows 18 inches apart, inserting a plant at every crossing of the lines, thus leaving them all 18 inches apart each way. After taking a first year's crop, he lifts every fourth row, so as to make an alley for the convenience of gathering from those left; besides it affords the latter more light and room to grow, and the space is not lost, as he crops it with Lettuce or Colewort. Under the partial shade of fruit trees and between rows of fruit bushes the Strawberry is also much grown, although the most favourable situation for them is acknowledged to be an open one. When under fruit trees the distance apart of the plants varies, and depends on circumstances, but 20 inches or 24 inches is the average; one, or at most two rows only are grown between the bushes. For the first year after planting Lettuces, Turnips, or other dwarfed crops are grown between the rows, and even in the winter of after years that space is not unoccupied; although Mr. F. Dancer denounces intercropping Strawberries, still he practises it himself. No care is exercised in their culture beyond hoeing and mulching, the latter being performed in May or June, or early in spring, and consists of the common stable manure, which, after it is washed by a shower, is quite clean. A common way of mulching is to scatter the manure over all the field, covering the plants as well as the ground. This being done early in spring, the foliage rises up through the litter fresh and strong. Gathering is done chiefly by woman, and in dry weather. The fruits are carefully packed into punnets, which are packed in large baskets for the convenience of waggon transit. After the fruit has been gathered the runners are cut away on either side of the rows, and all dirt taken immediately to the centre of the alleys, which are then dug and cropped. A plantation lasts good for three years, bearing sometimes more or less according to the land and the dry or wet summers.—"Field."

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Oranges.—These are now raised in such quantities, and of such excellent quality, in the neighbourhood of Galveston, Texas, that the importation of the fruit, it is thought, will shortly cease at that port.

Cherry Trees Shedding their Fruit.—I have two Cherry trees (Governor Wood and Elton) on a south wall (in a cold wet climate) which blossom magnificently every year, but the fruit never ripens. I have tried all sorts of plans to induce it to do so, such as watering freely whilst stoning, root pruning (they are very vigorous), taking half the blossom off, but all to no purpose. Just as I think I really am going to have a crop they all fall. Can any of your readers help me in this matter?—J. P., York.

Raising Vines from Eyes in Turf.—In reference to Mr. Simpson's remarks on this subject (see p. 80), allow me to say that I have "discovered" nothing whatever to induce me to "retract" a single statement which I have made as regards raising Vine eyes in turf; notwithstanding Mr. Simpson's eight years' experience at Dalkeith, I am assured that the young Vines employed to plant the Lady Downes house there were raised from eyes in turf. Mr. Simpson admits that when he was at Dalkeith Mr. Thomson planted Vines on turves when they were about 18 inches high. Surely, therefore, he must have raised Vine eyes in the same material. But, be that as it may, I can assure Mr. Simpson that I was practically acquainted with raising young Vines in turf before ever I knew that a young Vine had been raised in that way about Wortley. Therefore the "plan which I now adopt" can scarcely be considered to have been borrowed from the system, "exactly as recommended" by him. —J. Muir.

THE KITCHEN GARDEN.

HOW EARLY POTATOES ARE GROWN IN LANCASHIRE.

I LIVE in a part of the country where nearly a whole parish, and portions of several others, are occupied in growing early Potatoes in a manner scarcely known, I think, elsewhere, and certainly worthy of imitation where this vegetable is largely required. Cottagers, large and small farmers, and nearly every occupier of land, have more or less to do with their production; and when I tell you that £70 was offered for the early Potatoes growing in a cottage-garden, on a piece of land that would not half support a cow, and that some of the growers have about a quarter of a mile, or upwards, of pits for the purpose (they are grown in pits), the affair must be considered important. So much so, that I have often wondered

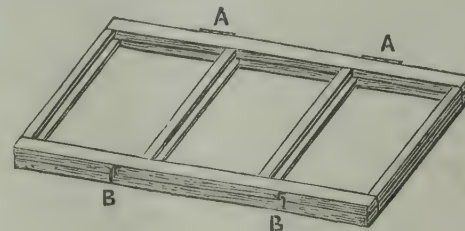


Fig. 1.

that the custom is so local. Perhaps when I mention that the neighbourhood where these early Potatoes are grown closely adjoins the district where the Potato was first cultivated in England, the subject may be rendered more interesting. The early Potatoes are grown in turf pits, covered with straw screens that are made in a peculiar manner. To the making of these screens I shall first direct attention, and in order to render my description more intelligible, I have prepared a few sketches of the process. Let a carpenter make a strong frame, 6 feet by 4 feet, which shall, when shut, resemble a monster kind of book-cover in two parts, which are hinged together strongly at the back, and fastened with hooks and staples where the book-clasps would be (fig. 1). The pieces forming the back, where the hinges are placed, and the front, where the bolts are used, should be of Oak, 2½ inches thick, and 6 inches wide. A piece at each end, and two in the middle, also of Oak or Ash,

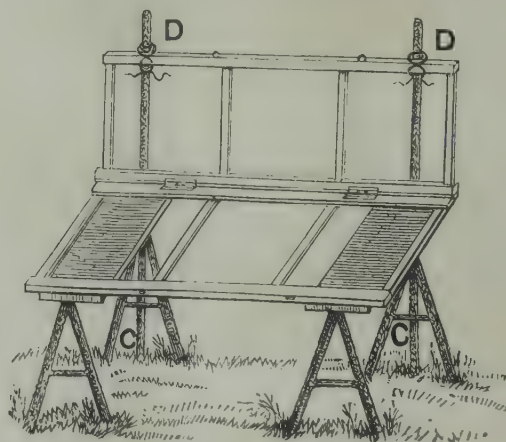


Fig. 2.

1 inch thick, are let into the pieces forming back and front, leaving between the "boards" a space 3 inches deep, which is intended to contain the material of the screen, or what would be the letter-press of a volume. Procure two tressels on which to place the frame—each tressel, when in position, having a post, or stout piece of wood, 6 feet high, let firmly into the ground at its end (as fig. 3). When the frame is laid on the tressels, one part is turned up and fastened to the posts (as at fig. 2). On the part of the screen that lies on the tressels, prepared pieces of tough branches of wood, such as Hazel, Oak, dead Spruce, Larch, or any durable young wood, are laid, and on the toughness of the brush employed, depends the durability of the screen. Such spray as that of Beech, Elder, &c., is of no use, as it only lasts one season, and when the wood is worn out the screen is comparatively useless. Now place on the wood long Wheat straw, to the thickness

of about an inch, equalising it over the whole frame, and making both ends full. More branches of a stronger kind are then laid on, keeping some of the straighter pieces for the outsides, and using three strong pieces cross-ways, to give strength. It is this middle enclosed brushwood that gives a firmness to the whole, and makes the screen as solid as a table-top. Add another layer of straw as before, on which place some of the flatter and lighter pieces of spray, as at first. Now bring down the turned-up part of the frame, and bolt together, as at fig. 1. Some amount of pressure will be required, owing to the mass of straw and wood employed, but this gives firm-



Fig. 3.

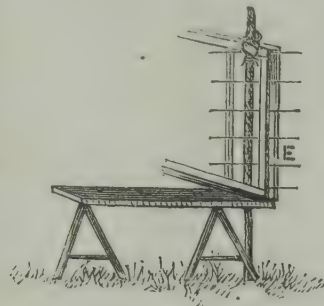


Fig. 4.

ness to the screen. Turn the whole of the screen up to the two posts (fig. 4), to which it is fastened at the top, the lower part still resting on the tressels. Tared twine must now be in readiness, with two needles made of hard Oak, a foot long (fig. 7), with perforated eyes, and a man on either side of the screen passes them through in three or five places, as at E (fig. 4), exchanging needles at every stitch thus forming a kind of brace-stitch (fig. 5). When this operation has been completed, twist off the ends of the brush and straw flush with the ends of the frame, and you have the screen represented in fig. 6. Although I have merely alluded to these



Fig. 5.

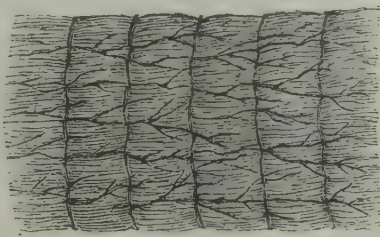


Fig. 6.



Fig. 7.

appliances as being largely used for early Potato growing, they are amongst the most useful articles in a garden. Placed at an angle of 45° over Celery rows, they would effectually protect them from wet and snow. Round early-made hotbeds they are also invaluable. Supported on bricks over Parsley-beds they afford protection in all weathers, and neither staking nor nailing down will be required. Early Vine borders may be thatched over with them, and three or more placed around shrubs will afford them a neat and efficient protection. Many other uses will suggest themselves. Temporary pits to any extent may be made with them; or, by laying them end

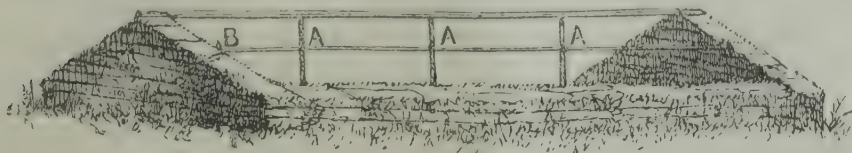


Fig. 8.

to end, tied to stakes, they furnish capital places for hardening-off bedding plants. They can be made by any labourer; and stowed away, when dry, under a shed, will last for years. Where used extensively by the Potato growers they are made into stacks and slightly thatched over till wanted. I will now proceed to explain the method of raising the Potatoes. These are grown in pits made of turf. The best and most sheltered situations adjacent to the dwellings of the growers are chosen; a good thick high hedge running east and west is a good site, or a sheltered piece of land is often wholly occupied by a series of pits running parallel to each

other; in short, naturally warm places are always chosen, and if they do not exist they are artificially made so. The pits are constructed of any required length from the sods on the place. The walls are 1 foot thick, 1 foot high at the back and front, and 4 feet high at the ends or gable; they are about 8 feet wide; a slight rail, answering to the ridge tile of a building, runs the whole length, supported, where necessary, by upright pieces, which, of course, run down the centre of the pit (fig. 8 A). A more slender rail, or even tar twine fastened to upright sticks, runs parallel with the ridge piece, midway between it and the walls, both at the back and front (as at B). Of course a slight rail is preferable to the twine, where obtainable. The use of the latter is to prevent the screen (one end, of course, resting on the wall and the other on the ridge piece) from swagging downwards with the weight of wet or snow. I will now suppose the pit to contain a sufficient quantity of highly manured soil, and to be ready for planting. The most important item, however, in the whole affair is the preparation of the sets, and this is peculiar and totally at variance with the directions usually given for the sprouting process of growing early Potatoes. The system generally advocated is to push the set into growth only for 2 or 3 inches, and then by exposure to green the sprout. In the method I am now endeavouring to describe the main point is to keep them white and tender, just as they would be when buried in the soil; and the theory is, that this is effected by keeping the

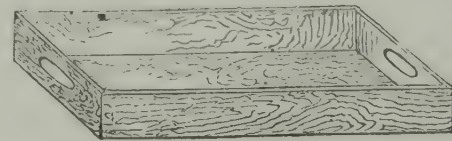


Fig. 9.

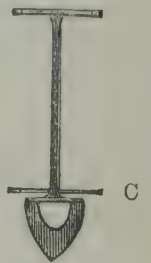


Fig. 10.

sprout continually growing from the first. Any greening or hardening is considered detrimental and a waste of time. On consideration, it will be evident that a Potato sprout that is greened and hardened before planting must become blanched and softened before it commences to grow. Laying down—that is, putting the Potatoes to sprout—commences about Christmas Day. A hay loft or barn floor, or any spare room, is used for this purpose. Selected medium-sized whole Potatoes are used, and placed as close together as they can be packed singly. Bricks or pieces of wood are placed at convenient distances as the Potatoes are laid down, serving as alleys. On these, slight slips of wood are placed over the sets, and the whole is covered over with stout paper, such as old newspapers, &c. This is done to exclude light and air, and acts as a kind of forcing process with the Potato. Hay or litter is placed over the paper in frosty weather. This method is a rather dangerous one in hard frost, especially in such a winter as we have just passed through. A modification of it, certainly to be preferred for general purposes, is to use light-made 9-inch-deep boxes, 4 feet long and 2 feet wide, with no tops (fig. 9). These are filled with Potatoes, as on the floors, and are piled one on the other in any convenient place. Being all of one size, the bottom of one serves as the top to the other. Old Orange boxes are well adapted for this purpose, and do well where they can be had. The sets, by this method, can easily be protected from frost, as, in extreme weather, they can be carried anywhere—they are sometimes put in rooms under beds. Planting time commences on Valentine's Day, the screens having been placed on the beds a few days previously to keep the soil dry, and the sets are uncovered on the floors or in the boxes for about three days, to give the sprouts a certain firmness. They are cut up as planted, each set having one good sprout about 6 inches long. Scrupulous care is taken to reject every sprout with a hard or black point. Holes are made all over the bed, 9 inches every way, with a kind of dibble shod with iron (fig. 10), which, owing to a cross piece (C), can only make the hole the required depth. One Potato is placed in each hole, and then the whole pit is raked carefully over with a wooden rake, or hay rake, which, as the sprouts are barely half an inch below the surface does not break the points. The

back screens are then put on from end to end, the ends on the ridge being kept true to each other, so that the front screens, when put on, form a good lap on the back ones. The work, as far as planting goes, is now done, and, as the Potatoes have had no check, they are up directly. The front screens are taken off every warm sunny day that comes, and put on early in the afternoon, always according to weather—and now the care begins. No sunny day must be lost, and a frosty hour would be fatal. It would be useless for anyone to attempt growing Potatoes largely on this plan, except they can afford to have some person nearly always with them. Small farmers or cottagers, with stout lads and lasses, generally follow it. A ton of screens to lift off in the morning, and put on again in the evening, is labour, and those who cannot afford cheap labour do not attempt it. The back screens are seldom taken off till the Potatoes are far advanced, or when rain would be beneficial, and the front ones, when taken off, are laid down sideways, tile fashion, but always below the level of the front wall, so that a single ray shall not be intercepted. The back screens being kept on, not only keeps the cold and the winds away, but prevents the heat entering on the unclosed or open side from being lost by radiation. It is a strange sight to see these Potato beds up and green in the open air in April. The Potatoes are ready early in May, and are packed in neat hampers, each containing 20 lbs., which sometimes realise 1s. per lb., which is thought a good price. They are bought up by dealers, who convey them to the manufacturing towns, Bolton, Barnsley, Blackburn, or Manchester, and quite an ovation is paid to the person who takes the first consignment to market. Innkeepers, shopkeepers, and others, present him with pieces of ribbon of every possible pattern and colour, which are pinned on every available portion of the dress, so that I have seen these men come back from the market thatched, as it were, with ribbons. Thus I have described at length, but I trust clearly, the practice followed to a very great extent by cottagers and small farmers. Gardeners will at once see the value of this system as the means of raising an intermediate crop between those grown under glass and warm borders in the open ground, and there is no doubt that these pits, in large gardens, could be utilised for other crops after the Potatoes. What a charming place for salading in parching summers, and what capital places to protect such plants as Lettuce or Cauliflower till the middle of February! No such use, however, is made of them by the Potato growers. When the Potatoes are off, the soil is thrown up into a high side, from end to end, and remains so till planting time comes round again.

THOS. WILLIAMS.

Bath Lodge, Ormskirk.

Mushroom Culture in Tan.—It may be of interest to some of your readers to know that Mushrooms can be grown in tan. I have grown them with great success, for three successive years, in tan which had been used for hunters to trample on through the summer, and of course there is some of their manure incorporated with the tan. The genial heat that the tan gives renders it one of the best materials that can be used for the growth of Mushrooms. When well beaten together with the horse-dung, and in sufficient quantity, I find the mixture more productive and lasting than horse-dung alone. The beds are, in fact, masses of clumps with as many as from twenty to fifty in each, which could be and were often taken up whole. Some may ask, Does not tan produce unwholesome fungi? With me, and used as stated, there need be no fear of this; I have not found one spurious one. As to flavour, they were pronounced by those who partook of them to be very savoury and delicate. It must not be inferred that I recommend tan alone, but let a quantity be put in a loose box, or any other suitable place where a horse is shut up for a time, so that its manure is well incorporated with the tan, and use it when in a good friable state, neither wet nor dry; if too wet the spawn will not run so well, and if too dry the beds will not keep in bearing so long. My experience leads me to think that tan will be much sought after when its qualities are more known to Mushroom growers, for I believe it to be superior to all droppings. —CHARLES PENFORD, *Meynell Langley, Derby*, in "Gardeners' Chronicle."

GEORGE II. having ordered his gardens at Kew and Richmond to be opened to the public during part of the summer, his gardener, finding it troublesome to him, complained to the King that the people gathered the flowers. "What," said the monarch, "are my People fond of flowers? Then plant some more."

THE FLOWER GARDEN.

PEONIES.

MR. BARRY, in a paper lately read before the Rochester Horticultural Society, made some remarks on these fine hardy plants, which are worthy the attention of all interested in hardy flowers. At the present time no class of plants of equal value is receiving less attention than Peonies? Is it because they are too well known, and therefore common? We cannot concur in any such opinion; and if we can do something towards awakening and reviving interest in this, one of the most striking and valuable floral productions of China and Europe, we shall be pleased. Peonies are commonly divided into two classes, Tree and Herbaceous, the latter being again divided into sub-classes. The Tree or Moutan Peonies are natives of China, and were first noticed in the year 1656, on the return to Europe of the first embassy of the Dutch East India Company. The attendants of this embassy having had freer access to that country than had been granted to any previous embassies, visited all the country from Canton to Peking, even the gardens of the emperor, and as the result of this visit, published a work describing among other things the Pine-apple, the Tea plant, as well as the magnificent flower of the Moutan. This volume, however, received little attention, being considered only as a collection of traveller's tales. The description of the Peony therein given was very full and complete, but the plant remained unknown in Europe until the late Sir Joseph Banks gave instructions to several merchants trading at Canton to inquire for the Moutan, and numerous plants were imported in the year 1794. It is said to have been cultivated in China for upwards of 1,400 years, and some of the Chinese authors say was first discovered growing among the mountains in northern China, whence it was brought into the southern provinces and there cultivated with the same enthusiasm as Tulips have been in Europe, some choice varieties of the Moutan having been sold in China for 100 ounces of gold. The Tree Peony sold at high prices when it first came into the hands of nurserymen in Europe, Monsieur Jositer, in Paris, receiving for plants of it more than 300 dollars each. This Moutan is the parent of most of the beautiful varieties of Tree Peonies now cultivated. Tree Peonies fill up a blank between deciduous flowering trees and flowering shrubs. In mixed borders they are invaluable, as well as single specimens on the lawn. They are quite hardy, but slight protection greatly improves them. They thrive in any good garden soil enriched with well decayed manure. September and October are the months best suited for their planting, but if in pots they may be put out in spring, when all danger of frost is over. Good plants set in autumn produce quantities of flowers the second or third year after planting. Each year the plants increase in size and beauty, and soon become the most showy and attractive features of the garden. They are the first of any of the varieties of Peonies to flower, and put forth their blooms early in May. Being naturally of what is termed slow growth, they are not propagated by division to any great extent, but chiefly by grafting upon the roots of the herbaceous varieties, which is done in August. The grafts are placed in frames, where they unite, and are transplanted the succeeding year into many rows.

To assist those who desire to form a collection we name the following choice sorts. Any description, however complete, would fail to do them justice; so we give only the distinguishing colours.

Moutans.

Alba variegata—One of the most striking double varieties. The outside petals are pure white and the centre pure flesh-red.

Arethusa—Light rose, shaded with purple; this is a very large and fragrant variety—and a vigorous grower.

Banksii (Chinese double blush).—Flowers pale rose-coloured, from 4 to 6 inches in diameter.

Gumperii—One of the finest kinds, producing bright rosy-pink flowers of great size and perfection.

Incarinata (double).—A fine white variety; flowers large and fragrant.

Rochlerii—A choice dark rose-coloured variety. Blossom large and plant vigorous.

Le Fevreiana—A very large and showy variety; flowers bright pink, with rosy centre.

Pride of Hong Kong—A striking variety; flowers of great size, light cherry-red with purple centre.

Queen Elizabeth—Blooms of immense size; rosy-crimson in centre, shading off to a light rose toward the margin.

Rosea odorata—Rose tinged with lilac, very large and flat.

Schultzi—A beautiful and fragrant kind; flowers carmine coloured, deeply shaded with rosy-lilac.

Zenobia—A large fine white variety.

Herbaceous Peonies.

Some beautiful varieties distributed a few years ago by the Royal Horticultural Society may also be found in English gardens. These are usually classified as officinalis, paradoxa and the Chinese varieties—the two first being European and the third Chinese sorts. These flower in succession, the first being the officinalis varieties, then the paradox, and the Chinese last. The Chinese varieties are particularly fine, and we regret not being able to give such a description of them as would induce every person who is the fortunate possessor of a garden to plant the entire collection. Herbaceous Peonies increase rapidly in size, and soon form a large clump, and thus, like all herbaceous plants, they should be divided occasionally, and the thriftiness of the plants will thus be greatly promoted. The most gorgeous floral exhibition we have ever seen was an acre of Peonies in full flower. Will you therefore allow me to furnish you with some notes made on the ground?

Ambroise Verschaffelt.—This is one of the newer kinds, and up to the present time one of the best dark varieties known. The flowers are purplish and full.

Carnea Striata.—Flesh colour striped with red; very fine.

Charles Verdier.—Another new and superb variety producing light lilac-rose flowers of great size and perfect form.

Delachii.—A striking and beautiful dark variety; flowers, purplish-crimson.

Festiva.—This is a sort which cannot be too highly praised. Imagine a plant 3 feet high, with beautiful dark green glossy foliage, and peering above it from ten to fifteen large heads of bloom, each from 6 to 9 inches in diameter, pure white, marked here and there with bright streaks of carmine, just enough to show how pure the white is, and how beautifully the carmine contrasts with it. Match this with an Ambroise Verschaffelt or a Delachii, and you have a picture, or a pair of them, fit for the greatest amongst us to admire, but within the reach of the humblest to possess.

Grandiflora carnea plena.—A variety of extraordinary size. A nursery row of this, with hundreds of enormous white blooms edged with blush, is a sight worth travelling miles to see.

Humeri is another kind which has large and showy purplish-rose flowers of great beauty.

Jules Lebon.—This has brilliant and distinct carmine-red flowers.

Louis Van Houtte.—One of the dark crimson sorts, which produces a marked contrast among the fancy-coloured varieties.

Louis Van Houtte (Caleb's).—Bright purplish-cherry, and a charming sort.

Marechal Vaillant.—A new kind, of a dazzling purplish-violet colour.

Madame Victor Verdier.—Crimson-rose, with light violet, very large and full.

But we have now given enough, we hope, to induce cultivators to turn their attention to these showy and really interesting plants.

Variegated Bedding Tropæolum Minnie Warren.—I am quite at a loss to understand why this extremely beautiful, easily cultivated, and in every way most thoroughly satisfactory foliage bedding plant, is so very seldom seen in our gardens, where, were its beauty and great merits but once known, I cannot but think it would soon become a universal favourite. This charming plant was raised as far back as 1869, by Mr. Cattell, of Westerham, and, when shown the following year at South Kensington, was most deservedly awarded a first-class certificate by the floral committee of the Royal Horticultural Society. It is accurately figured in Vol. IX. of the "Floral Magazine," plate 506, and is there described by the Rev. H. H. Dombrain in the following terms:—"It is, as will be seen by our plate, exceedingly dwarf in character—in fact, of a regular Tom Thumb habit of growth; the ground colour is green, blotched and broadly margined with pale cream, which bleaches to pure white as the leaves reach maturity. It is perfectly constant in its variegation, and very seldom produces blossoms—another great merit in a foliage bedding plant." When, however, it does bloom, and is allowed to seed, the seedlings come quite true to the beautifully variegated character of the parent plant. When bedded out in a scroll or pattern bed with a line of Iresine Lindeni, on either side the contrast produced between the two plants has a most striking and pleasing effect.—W. E. G.

Primula altaica.—The plant referred to as *Primula altaica* (syn. *grandiflora*), at p. 90 of your last number, is not *P. altaica*, but a variety of *P. vulgaris*. *P. altaica* is closely allied to *P. farinosa*, and has very narrow leaves (not half an inch wide), and umbels of numerous small flowers in the style of *P. farinosa* and *P. sibirica*. It is probably not yet introduced into Europe. The variety of *P. vulgaris* referred to has long been erroneously called "altaica" by horticulturists. Why? Probably "no one" can tell.—JAS. BACKHOUSE, York.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Forcing Early Potatoes and Carrots.—Look to the seed Potatoes that were advised some time back to be placed in shallow boxes for sprouting and planting next month; they should now be pushing strong sprouts hard and green, that is if they are in a place in which they can receive sufficient light. They will generally get enough if the boxes are placed under a greenhouse stage or on the floor of a cold Vinery, or in a shed or empty room of any sort where there is enough light to prevent their drawing up weakly. Some stable manure and leaves in equal quantities, if the latter are at hand, should be got ready to make up slight hot-beds for early Potatoes and Carrots. Let these fermenting materials be well shaken together and allowed to lay for ten days or so, turning them over once during that time to sweeten, then make up the beds about 2 feet thick, and at once apply the frame, in which put about 10 inches of soil in a moderately dry state, and plant about 4 inches deep any early Kidney varieties. These are the most suitable for forcing, as they do not make such large tops as some others; place the tubers 10 inches asunder in the rows, which should be 14 inches apart; room will thus be left for a thin crop of Radishes, which should be sown at once over the surface, raking in the seed. There is not much danger of a bed of this kind getting too hot, yet overheating does sometimes occur, thereby injuring the Potato plants that are in the centre. When the bed is made and soiled insert a trial stick right down in the middle of it; this can be drawn out daily for a week or two, and felt so as to ascertain the heat, which should not rise above 70°. If there is any doubt about the temperature, plunge a thermometer in the bed, and if it indicates more than the heat just named, get a stout stake and drive it right into the sides of the bed to the centre in several places, leaving the holes so made open for a few days so as to allow the heat to escape. A bed for Carrots (Early French Horn is the best for forcing) may be made, and soiled to the same depth as for the Potatoes. Let the seed be sown at once in rows 8 inches apart, covering it with half an inch or so of soil. If a good body of warm leaves is at hand, the dung may be dispensed with altogether, or not more than a fourth of it need be used, in which case the beds may be made up at once without further preparation of the materials, as leaves are not liable to get too hot. Give air every day as soon as the crop appears above ground. If there happens to be a deficiency of autumn-sown Cauliflower or Lettuce plants, a few seeds of these may be sown in pans or boxes, and placed in beds such as the above, where they will soon vegetate, and when large enough to handle they should be pricked out in a frame or under hand-lights, from which they should be afterwards transferred to the open ground.

Cucumber Beds.—Where there is no other convenience for growing Cucumbers except in ordinary garden frames, stable manure should at once be prepared, as advised for the preceding beds, using, if available, half leaves mixed with it, and the heap should be turned over once or twice until it is in proper condition for making up into a bed. If the plants have to be raised from seeds in this way, it is best to make up a bed for a single light frame, in which to raise them, and when the plants are large enough, as this bed becomes cold, to have a larger one in readiness in which to grow them. The bed in which they are raised should not be less than 4 feet in thickness and 1 foot larger than the frame on all sides; by this means it will keep hot longer than it otherwise would do. As soon as the internal heat of the frame subsides to 80°, sow the seeds in small pots, two or three in each; keep the plants when up near the glass, and give a little air on mild days, covering the glass with double mats at night. Where such a bed as this exists, quantities of cuttings of summer bedding plants may be struck in it and then hardened off.

Walks and Weeds.—By this time most of the winter manure and soil-wheeling on the garden walks should be over; and, where the gravel has got black and unsightly, 3 or 4 inches of the surface should be turned, and, if deficient in gravel, some should be added to the top, giving the whole a thorough rolling as the work proceeds. The walks in a kitchen garden, where anything approaching an orderly system of gardening is attempted, should be as well drained and constructed as those in the pleasure ground. Now is the best time to go over walks generally, and hand-pick all weeds, whilst the surface is soft. Market gardeners who grow for profit, and who, no doubt, calculate the return they expect to get for every shilling they expend in labour, set an example in respect to weeds that amateurs and others would do well to follow. With them it would be a difficult matter at any season to find a bushel of weeds on an acre; their system is to destroy every weed as soon as it vegetates, by frequently running the hoe over the ground.

Fruit Buds and Birds; Pruning and Training.—During this month birds often greatly damage the bloom buds of

bush fruits. See that the trees that were threaded over some time since, or syringed with lime and soot-water, are effectually protected; if the thread has become black, or been removed by the wind, run a few more strands round each bush, or apply more of the lime mixture with the syringe. Such appliances cost little in labour or material compared with the loss of a crop of fruit, and permanent injury to the trees by the bloom spurs being destroyed. Standard Apples or Pears that have been planted through the autumn and winter, even if staked at the time, should be examined to see that it has been done effectually before the March winds begin to blow, for they will be injured if not well secured. Peaches, Nectarines, and Apricots, on open walls, will require immediate attention in the way of pruning and nailing, for if these operations are deferred too long the buds get so prominent as to be knocked off in quantity during the progress of the work. Apricots, bearing, as they do, a good deal on spurs, do not require so free a use of the knife as the others. On the contrary, as much of the wood should be nailed in close to the wall as possible, as on a frosty night the bloom thus situated will frequently escape, where such as is further from the wall gets destroyed. Do not leave the shoots of Peaches and Nectarines too crowded, and, in pruning, reduce the shoots to something like two-thirds their original length, as near as may be, always cutting to wood buds, which are easily discernable from their long pointed shape as compared with the round blossom buds. If the shoots are strong, they will contain numbers of double bloom buds, with a wood bud in the middle, this centre bud will form a leader to the shoot, without which the fruit will not swell freely. Sufficient foresight should always be exercised in pruning Peaches and Nectarines, to see that provision is made to supply the trees in all parts with young wood for the coming year, that is, by cutting a sufficient number of the last season's shoots out to near the point from which they spring, and where there usually exists several wood-buds, the best placed of which should be grown on to form a shoot for tying in the following year, in place of older wood, which it may be advisable to remove. For the same reason, in pruning at the present time, it is well to cut out any long straggling branches that have no bearing wood upon them, except near or at their extreme points. In pruning these trees, obviously, the first consideration must be the current season's crop, but at the same time, by a little forethought, the operator will easily see where it is advisable to encourage a shoot for next year's bearing. It is the want of this kind of attention that reduces numbers of these trees to nothing but strong bare wood, unfruitful except at the points of the shoots. Young trees are in the same way often spoiled by leaving the strong shoots too long, instead of shortening them well back. It should always be borne in mind that at whatever point the shoots of such trees are cut back to from that point, several young shoots will usually push, but not lower down nearer the base; consequently it will readily be seen where next year's shoots should be induced to spring from, so as to properly furnish the future tree. As soon as a tree is pruned, nail it at once. The right way to proceed in this is to begin in the centre of the tree, taking a branch straight upwards, selecting for this, as near as the eye can decide, the one that will leave an equal portion of the tree on each side, and nail this in regularly over the allotted space. This applies, in pruning and nailing, to both dwarf and standard trees of these fruits. There is another matter to which the amateur should always attend, and that is, never to nail the shoots too tightly. Every shoot ought to have double its thickness of room allowed in the shreds, so as to admit of its thickening. It is also most essential not to bruise the bark, as there are no trees so liable to gum, if the bark is bruised, as Peaches and Nectarines.

Shrubbery Borders.—In the shrubbery, the removal or planting of any deciduous trees or shrubs should at once be completed, otherwise the season's growth will not only be sacrificed, but the health of the trees endangered so much as to make it advisable to defer such work until the autumn. In any place that is well kept, and no weeds allowed to grow amongst the shrubs, there is no necessity for digging between them, which, except with the object of burying weeds, is much better left undone, effecting, as it does, nothing but destroying a large quantity of the best surface-roots; however, where weeds have been permitted to get ahead, there is no resource except digging, for to hoe and remove them robs the land, and much soil is unavoidably carried away in the operation; consequently, where shrubberies are very weedy, they should at once be dug, going no deeper, however, than sufficient to bury the weeds and not mutilate the roots.

Glasshouses.—In the stove, greenhouse, and pits the work will consist principally of watering and in giving air, which, if the weather is mild, may be admitted in greater quantities than hitherto; side-lights should not, however, be opened when the wind is strong, so as to admit a chilling current amongst the plants.

BAGATELLE—BOIS DE BOULOGNE.

THE picturesque style of gardening as seen round Paris is mainly distinguished by its tempestuous undulations. In the Champs Elysées every patch of turf is waved up and down in the most violent manner. The adjacent level lines of roadway, footway, or buildings, contrasting abruptly as they do with all this, show its artificial character at once. When valleys are traced through bits of turf not much larger than a dining-room floor, and surrounded by wide level walks, we get the puerile instead of the picturesque. One might as well attempt to diversify the surface of a dinner table. In addition, the undulations are stiffly and badly carried out—scarcely an easy, natural gradation is seen. Sir Richard Wallace's garden, in the Bois (a view in which we now publish), offers, in this respect, a pleasing contrast to the many places in which the above-named blemish is conspicuous. Here we have broad easy glades, so gently, though artificially, hollowed, that they never even suggest the artificial or the incongruous. Here, too, may be seen most artistic and successful attempts to open up long and charming views, both in the garden, and from it into the surrounding country. Happiest of the features, however, is the way these glades and vistas are planted. Instead of the usual plum-pudding-like mixture everywhere, we have the small groves of distinct trees, with the turf spreading beneath them; beautiful natural-looking groups of various choice trees, and sometimes a small group of one kind, only there is not a trace of the dot-a-tree-everywhere system, by which so many garden-landscapes are spoiled. The consequence is that open breezy turf carpets abound, and afford a foreground from which the various beauties of trees or shrubs may be seen to advantage at hand or at a distance. Groups of Yuccas are effective here; also groups in threes of various tree Peonies and other fine hardy plants. Many of the older trees, with high stems, are clad with a mantle of Irish Ivy, which, however, is confined to the bole only. This, when planted against well-grown trees, does not seem to do any harm to the health of the tree. Where a number of tall trees thus covered occur, one may sometimes fancy (seeing only Ivy-clad boles) that it is an evergreen grove, the heads of the deciduous trees being high overhead. This is one of the many effective uses made of the common Ivy here. By the way, tree Ivies worked high as standards, are now seen here and there in Paris gardens. Two large groups of artificial rock here are the most successful we have seen in France; one is a very old group, the other new, both so gracefully embellished with suitable plants, and so well supplied with masses of trees and shrubs that they have a picturesque and, in every way, satisfactory effect in the grounds. Here, however, as in other places, no attempt is made to grow the true Alpine plants in or near these inviting positions; that is work for the future. Where there is so much to praise, we venture to point out that the artificial water here, as in too many gardens, is rather too much after the duck-pond pattern—too abrupt in its margins, and too near the house. With a graceful bend of the Seine glistening through one of the vistas, it would have been wiser to have dispensed with artificial water. Such contrasts remind us of the full moon and stars calmly shining down on a poor mundane illumination.

Gas Heating.—I am about to erect a greenhouse 20 feet by 15 feet, and am anxious to know if it can be safely heated by means of a gas stove. A friend of mine has heated a smaller one in that way, but, as it has not yet stood the test of experience, I am desirous of knowing what you think of the plan. His stove is about 3 feet high and 15 inches in diameter, with two sets of burners at the bottom, and a 3-inch zinc pipe from the top goes round three sides of the house and out at the roof; there is a small pipe to let air in at the bottom of the stove, and the orifice is protected by a little wickerwork to prevent too strong a current of air from blowing out the gas. The advantages of the plan are obvious, as there is nothing to be done except light the gas, and in a few minutes the temperature rises to any required degree, according to the number of jets turned on; and, as gas is cheap here, say 3s. 6d. per 1,000 feet, I presume it would be much more economical than coal. I may add that the cost of the stove and piping, complete and fixed, was £5 10s.—EDGBASTON. [A similar system of heating has been in operation in a small house, near London, for several years, and is found to answer satisfactorily.]

Amadou.—This frequently goes by the name of German tinder, and is employed in procuring light speedily. It ignites immediately with a feeble spark from the flint and steel, or by condensation of atmospheric air, and burns with slow and smouldering heat for a considerable time. It is formed of a spongy excrescence or Fungus found on old trees, particularly Oak, Ash, and Fir. This is washed and boiled in water, and afterwards beaten with a mallet, until it resembles very spongy leather; it is then soaked in a saturated solution of saltpetre, and dried in an oven.

VIEW IN SIR RICHARD WALLACE'S GARDEN IN THE BOIS DE BULOGNE.





THE INDOOR GARDEN.

HARDY PLANTS UNDER GLASS.

HARDY plants, to me, are quite as interesting as the gorgeous Orchids for which my more wealthy neighbours give fabulous prices. They are inexpensive, and I can grow them myself in my own way. In my greenhouse—or, rather, in my hardy house, for I have neither hot-water pipes or air flue to heat it—I am in no concern for my plants should severe frost prevail, for a few sharp pinches at night will not injure them. When a change comes, and the sun now and then peeps out and warms the air, a reaction takes place, and the bulbs burst rapidly into life, the blooms expand, and from that moment until the heat of summer compels me to transfer them to cooler quarters, I enjoy their beauty. In early spring especially, whilst, as yet, flowers are scarce in the open ground, they fill a void for which other plants are not available. My hardy plant-house is not an ordinary building, with the usual fittings of shelves and stages. It is merely a span roof, rather low than otherwise, with a door at either end. The inside is composed of earthwork and a rugged stone formation, having a semicircular border on either side, and a raised mound in the centre. On this I have permanent patches or dressings of the evergreen Sedums intermixed with a few hardy Ferns, and then in every possible, and almost impossible, place are planted out or plunged in pots all conceivable kinds of hardy spring flowers, but all are so placed that they can be liberally supplied with water and kept growing as vigorously as in cool borders. As I have a good water supply with a fair pressure, I have a stopcock placed in an unostentatious fashion in one corner of the house, and, when it is necessary, merely affix my gutta-percha hose, I turn on the water, and give all my plants a generous soaking in a short time. Remembering that if these plants were growing in the open borders the soil about them would, all the winter, be full of moisture, I keep the soil of my house moderately moist, and when the plants spring into activity they get a more liberal supply, especially when the days increase, as they do now, in length and the atmosphere becomes drier. I have the roof of my house constructed of light rafters and with moveable glazed lights. When the hot weather comes the latter are removed, light frames covered with tiffany take their places, the side sashes are removed, and the ends of the house shaded. I thus secure a cool and pleasant place in the summer months, plenty of air, whatever rain happens to fall, and a grateful shade. My glazed lights are placed on a temporary framework and under these I grow Cucumbers, Melons, and Tomatoes, besides raising seeds of choice hardy plants that thrive better under the shelter of glass when in their youthful state than when exposed either to heavy rains or the scorching sunshine. My house is now gradually developing its beauties. Patches of the blue Scilla and white Snowdrops are bursting through in humble rivalry, with Primroses of varied colours, white, yellow, mauve, red, lilac, purple, and crimson; and Polyanthus equally varied in hue. Double Primroses are also throwing up their numerous flower buds; the crimson, pink, and white-flowered variegated Daisies I specially admire for their foliage. Then there are already in bloom some half-dozen kinds of the lovely *Anemone hepatica*, and the *Myosotis dissitiflora* is bursting its buds of cerulean blue in all directions, before long its small brilliant bunches of flower will have appeared. Strong plants of the trailing *Lithospermum*, that have shown a few of its deep rich blue blossoms all through the winter, are here, and patches of the hardy white *Polygala*, besides the creeping *Daphne*. Then are seen Violets, single and double, Violas, and Pansies of different hues, and hardy Primulas in great variety. Just showing the bud are *Cortusoides amœna*, *C. lilacina*, *C. grandiflora*, and *C. alba*; and *C. nivalis*, *C. intermedia*, and *C. alpina* somewhat more advanced. Then I have *Arabis albida præcox*, which is in full bloom—the variegated kinds pleasing in their foliage—and rosea giving promise of good heads of flower at a later date. The white and pink Christmas Roses have thrown up fine and showy blossoms, and the *Aubrietias* are following suit—*Aubrietia variegata purpurea* is at all times a gem, but is especially so under glass. Then early dwarf kinds of the *Iris*, *Saxifrages*, and creeping

Campanulas afford plenty of groundwork for the choicer kinds of *Crocus*. Lastly I have Tulips, with *Narcissus*, Grape Hyacinths and the *Triteleia uniflora*, but even these do not constitute all the inmates of my hardy plant-house. I labour to fill it as much as possible with early-flowering plants, for these at the commencement of spring are much rarer than in the month of June, besides which they are not so lightly heated by the elements as during these later months. Then I can be ever changing, for it is needful each autumn that there should be a re-arrangement of many plants, some requiring dividing, some re-placing, and others must be laid aside altogether in favour of new comers that I may have been fortunate enough to add to my collection. I find it is well to have a reserve in the open ground of small stocks of most of the choicer plants, as some may die or need removal into the open ground for a year to enable them to recruit their crowns; but, as a rule, they all thrive well, and I attribute their general health not a little to a constant supply of water, cool shade in the summer, and liberal top-dressings of rich soil and cocoanut fibre, which is one of the most valuable mulching agents for flowers that can be found. Being somewhat of an enthusiast for spring flowers, and, indeed, for hardy plants of all kinds, I am often not a little vexed when I see my friends throwing away their yearly allotted garden money on tender soft-wooded stocks that the first frost will decimate. I would, if I knew how, endow them with some of my love for these hardy gems. Perhaps my present work may tend some day to accomplish this, and I should seek my reward in the knowledge that I had contributed in no small degree to an enhancement of their own pleasures.

D.

EURYA JAPONICA VARIEGATA.

THIS finely variegated Japanese plant should be as generally grown for the decoration of cool conservatories as the different varieties of *Croton* are for that of the stove; it is easily propagated by means of cuttings made from the points of the shoots, struck in sand in heat, and then potted on in either sandy peat or good loam. It will succeed in either, being, like almost all Japanese plants, not at all over-particular as to the soil it requires; but with this, as with other plants, there is a vast difference betwixt the progress it will make if well attended to and pushed on by re-potting as required, and the comparative slowness which plants show that only get a periodical shift once a year, as is too often the case with hard-wooded subjects, be they slow or fast growers. When the cuttings are rooted, which they will be in a few weeks if put in at the commencement of the year, at once move them into 3-inch or 4-inch pots, according to their strength and the amount of roots they have made; replace them in the stove, and encourage growth by the use of the syringe in the afternoons, pinching out the points of the shoots so far as is necessary to lay the foundation for the future specimen, the shape of which should now be determined on. For decorative purposes, under almost all circumstances, a pyramidal form looks the best, and is the most useful; but it should not be too regular in the outline. This can be secured by allowing a reasonable amount of freedom to the lateral branches, and in not stopping them all one length, which will give them the intolerably formal appearance so objectionable in a plant grown for the effect produced by beauty of leaf and habit of growth in place of flowers. The centre shoot should be tied up to a neat stick, and stopped only so far as to prevent its running away with too much of the sap, the certain consequence of which is to leave the plant deficient of branches near the base. In this the grower must be left to judge of the requirements of each individual plant—some, as in the case of those of similar habit, having a greater disposition than others to grow upright or spread horizontally, as the case may be. By mid-summer, if all goes well, the pots will be full of roots, and another shift should be given into pots 3 inches larger, again returning them to the stove, or any house or pit where they will receive a moderate amount of heat and moisture. They will also be benefited by a little shade in bright weather. Syringe, as hitherto, once a day, which will not only assist growth, but tend to preserve them clear from insects. Keep them growing through the autumn, and if, before the end of the year, they require additional root-room, they should have it, as the object is to get the plants on in size as quickly as possible. There is no necessity to give rest during the winter; if growth were stopped in that way there would be considerable loss of time. With some plants, rest, even in the first year of their separate existence after being struck from a cutting, is more or less necessary; with others like that now under consideration it is not required, con-

tinued growth not having the slightest tendency to weaken the constitution if not pushed too far; consequently, if the pots they are in are full of roots, move them into others 4 inches or 6 inches larger, according to the strength of the plants, and keep them growing through the winter. Attend regularly, as they increase in size, to keeping the leading shoot in an upright position, and stop any lateral shoots that threaten to make more than their share of growth. The points of the shoots should also be so far pinched out generally as to cause the plants to form sufficiently close full growth; again shade slightly when bright weather comes. By midsummer examine the pots to see if they are becoming filled with roots, which, by this time, they ought to have in plenty, and, if it is required, move them on into larger; whichever is used, peat or loam, all through the several pottings, see that it contains plenty of fibre. Soil that is of a close heavy nature, even when a quantity of sand is added, is not fit for any plant intended to have its roots always kept in a confined space, neither will plants that are placed in such make near the progress that they will in fibrous soils. By the middle of September the plants may be hardened off a little by keeping them cooler, and dispensing with shade; and through the autumn do not keep them in a night temperature of more than 50°, nor less than 45°; for it must be borne in mind that, although the plant is all but hardy—if not ultimately found to be quite so—the growth has all been made in heat, and that the plants would not bear the first comparatively low temperature to which they were submitted immediately after a summer's growth in heat. It is a plant that naturally requires a great deal of water, and is in no way injured by receiving it in abundance at the root when in active growth and if the soil be filled with roots; but through the winter, when at rest, it will neither require nor bear to have much. On the other hand, like all evergreens, the soil in which it grows must not be allowed to get too dry, or the leaves will fall, and an injury to the plants be inflicted which a season's growth can alone repair; whilst, at the same time, the strength of the roots will be correspondingly exhausted. It should now be considered what size the plants are required—whether for moderate-sized or large specimens; and whether it is desirable, in the latter case, to develop them as quickly as possible; if so, they should, after a couple or three months' rest, be again placed where they will receive more heat, and be potted and grown on as before; or a portion of them may be so treated, and the rest put under a slower treatment by allowing them greenhouse room throughout the summer, giving them also such additional root-space as they need. They will make very beautiful, neat-sized conservatory decorative plants, for mixing with other fine-foliage subjects or flowering plants. In the conservatory it will be thoroughly at home, merely requiring to have its wants supplied with water, and additional root-room as the pots get too small. If it ever gets thin of leaves, and the branches look bare, they may be shortened back moderately in the spring before it begins to grow; and, if kept for a time in a little closer atmosphere, and growth be encouraged by syringing overhead, it will break freely, and soon form good fresh foliage. It is not subject to insects, but green fly will live on the points of the shoots; and if the insect is allowed to establish itself on the young leaves, it will cripple and disfigure them. Red spider will also live upon it, but, from the nature of its leaves, it is well able to bear the constant use of the syringe in the summer season, and this pest can have little chance of gaining a footing. Scale, both brown and white, will live on it. The former can be kept down by the use of the sponge; but, as regards the white species of this insect, prevention is much better than cure, and this can be managed by never allowing them to come in contact with anything affected with the pest. If once the plants get infested with it, there would be no chance of its complete destruction except cutting back into the bare hard wood, and dressing with insecticide sufficiently strong to destroy the insect, which would take a stronger application to kill it than the leaves of the Eurya will bear. This plant might be grown as a standard in the manner and for the purpose that the Sweet Bay is used. The immense demand for plants of this description, for standing out in the summer season on terraces and similar places, may be easily understood by the prices they fetch. No plant with which I am acquainted is so likely to make a fitting companion as a standard for the Bay as this Eurya; its handsome glossy foliage, still further increased in beauty by being variegated, could not fail to render it attractive so grown. Undoubtedly it would take time to get it up to the required size; but so it does with the Bay or even Portugal Laurel when grown for this purpose. The plants would require to be so treated as to form a clear stem of the requisite height by removing all side shoots until the desired height was attained; after which the plants would simply need keeping in shape by pinching out the points of any shoots that were overgrowing the rest, so as to regulate the formation of a head, and removing any side breaks

that might make their appearance; but with these I should not apprehend much trouble. The treatment in other respects as to general cultivation would be the same as above advised when they were intended for indoor decoration; and in the winter season the plants could be placed in a Vinery at rest, or any similar place where room was available. The plant is benefited when making active growth by the use of manure-water; as the pots or tubs it would ultimately occupy got filled with roots, it could for many years be kept in a growing condition by assisting it in such manner during the summer season.

T. BAINES.

SUB-TROPICAL PLANTS IN WINTER.

MUCH as these have assisted in relieving the monotony of the bedding-out system, I believe they have not as yet reached the summit of their popularity; for the majority of them are of very easy culture, and possess the great merit of being readily increased from seed; and, being of very rapid growth, they only require the protection of glass for a short period before they are fit to rank with the most beautiful objects in the garden. But it is not so much their effect during the summer as their value after their outdoor season is over that induces me to plead for their extended cultivation. One of the uses that I have found them eminently fitted for is the decoration of ball-rooms, saloons, and entrance-halls, or wherever a mass of foliage may be desired. *Acanthus latifolius* produces an excellent effect under these circumstances, its freshness of colour and bold outline making it a formidable antagonist to many of our permanent stove-plants. *Abutilons*, both plain-leaved and variegated, are also thoroughly adapted to such purposes, as well as *Ricinus*, *Solanums*, and *Wigandias*; and, as a graceful rival to the Ferns, *Acacia lophantha* is exquisite by daylight, but is scarcely so effective by night, as its leaves close up; whilst the *Centaureas*, as silvery edging plants in contrast with *Echeverias*, show out to perfection. For furnishing single vases or as table plants *Chamaepeuce Cassabonæ* and *diacantha* can scarcely be excelled in beauty of appearance under strong artificial light by the choicest of stove inmates, and they have the great advantage of not being so susceptible to injury from the great variations of temperature that often occur in crowded assemblies. Where plants of a more permanent character are employed, as Palms, tree Ferns, *Phormiums*, &c., the varieties suitable for the purpose are unlimited; the only additional care required being that the plants should be plunged in pots during summer, and lifted before any injury occurs to foliage from frost or storms. A cool Vinery suits them admirably, as the partial shade of the Vines is beneficial at first, for they will lose some roots in removal. A liberal allowance of water and a slight syringing overhead will quickly and thoroughly establish them, and they will well repay any labour bestowed on them as a surplus stock of foliage ready for any sudden emergency, besides often doing duty as substitutes for plants that the owners would not like to risk out of their regular quarters during the season when decorative plants are most in request in many country mansions.

J. GROOM.

SOWING AND GROWING AMARYLLIDS.

IN reply to your correspondent's query (see p. 82) as to the best time for sowing *Amaryllis* seed, I have to state that I have been successful in rearing seedlings sown at various periods of the season. Generally speaking, the seed is ripe in August, and may be sown at once. If this be done, the seedlings will come up very freely in the course of eight weeks, and only require to be kept growing during winter in mild heat. What the grower has to guard against is thrips and red spider, both dangerous enemies to the health of *Amaryllids*. It is better to keep the plants in a mild than in a heated atmosphere, as it is well known that an over-heated atmosphere generates quantities of these marauders, and they are not very easily kept down. The shortest time I have been able to get bulbs from seed capable of flowering is three years and a few months. In four years' time from sowing, the bulbs ought to be strong enough to produce flower scapes. To accomplish this, however, there must be no time lost in quickening growth. It is better to give the seedlings a run of root growth in a bed rather than cramp them in pots. Pot culture of seedlings is slow work, too slow for the eager cultivator; hence I would strongly recommend them to be planted out after the fashion of nursery rows in some low heated pit. The heat does not require to be great, only a degree or two in advance of greenhouse temperature. This attended to, and the seedlings kept growing, they will soon come away and swell up to bulbs of fair size. Then they must have their period of rest like all bulbs—I ought to say, like all herbaceous bulbs. The evergreen bulbs, such as *Vallota*, for instance, require constant attention with the watering-pot. Bulbs of the *Amaryllis* or *Hippeastrum* proper require a good drying from

September to January, as a rule, although there are exceptions. I find, for instance, that the beautiful white *A. marginata grandiflora* flowers best in autumn and grows in winter, something after the fashion of those charming and brilliant Cape bulbs, the *Nerines*, whereas *Marginata venusta* and *Marginata conspicua* take after the ordinary run of the breed. Beautiful as some of these well-known sorts are, they are now completely eclipsed by some of the gorgeous seedlings of more recent times. I hope to be able to show a collection of them in the course of a few months at South Kensington or some such place, where the public at large may have an opportunity of seeing them.

JAMES ANDERSON.

Meadowbank Nursery, Uddingston.

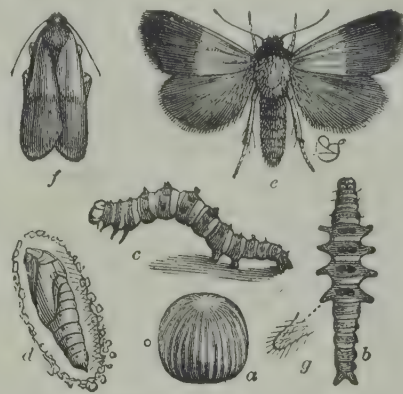
SPOTTED TRUMPET-LEAF INSECTS.

At a meeting of the American Association for the Advancement of Science, held at Hartford in August last, the following paper, "On the Insects associated with the Spotted Trumpet-leaf (*Sarracenia variolaris*)," was read by Mr. Chas. V. Riley, of St. Louis, Missouri. The insect-catching powers of those curious plants, the Flytraps (*Dionæa*), the Sun-dews (*Drosera*), and the Trumpet-leaves (*Sarracenia*), have always attracted the attention of the curious; but renewed interest has been awakened in them on account of the interesting experiments and observations on their structure, habit, and function, that have lately been recorded, and especially by the summing-up of these observations in some charming papers by Professor Asa Gray, which recently appeared in "The Nation" and the "New York Tribune" under the title of "Insectivorous Plants." Through the courtesy of Dr. J. H. Mellichamp, of Bluffton, and of H. W. Ravenel, of Aiken, South Carolina, who have sent me abundant material, I am able to submit the following notes of an entomological nature on the Spotted Trumpet-leaf (*Sarracenia variolaris*), which must henceforth rank with the plants of the other genera mentioned as a consummate insect-catcher and devourer. The leaf of *Sarracenia* is, briefly, a trumpet-shaped tube, with an arched lid, covering, more or less completely, the mouth. The inner surface, from the mouth to about mid-way down the funnel, is covered with a compact decurved pubescence, which is perfectly smooth and velvety to the touch, especially as the finger passes downward. From mid-way it is beset with retrorse bristles, which gradually increase in size till within a short distance of the bottom, where they suddenly cease, and the surface is smooth. There are also similar bristles under the lid. Running up the front or ventral side of the trumpet is a broad wing with a hardened border, parting at the top, and extending around the rim. Along this border, as Dr. Mellichamp discovered, but especially for a short distance inside the mouth, and less conspicuously inside the lid, there exude drops of a sweetened viscid fluid, which, as the leaf matures, is replaced by a white, papery, tasteless, or but slightly sweetened sediment or efflorescence; while, at the smooth bottom of the pitcher, is secreted a limpid fluid possessing toxic or inebriating qualities. The insects which meet their death in this fluid are numerous, and of all orders. Ants are the principal victims, and the acidulous properties which their decomposing bodies give to the liquid doubtless render it all the more potent as a solvent. Scarcely any other Hymenoptera are found in the rotting mass; and it is an interesting fact that Dr. Mellichamp never found the little nectar-loving bee or other Mellifera about the plants. On one occasion only have I found in the pitcher the recognisable remains of a *Bombus*, and on one occasion only has he found the honey-bee captured. Species belonging to all the other orders are captured; and among the larger species that I have most commonly met with, which, from the toughness of their chitinous integument, resist disorganisation and remain recognisable, may be mentioned *Asaphes memnonius* and *Euryomia melancholica* among Coleoptera, *Pentatoma lugens* and *Orsilochus variabilis* var. *complicatus* among Heteroptera; while katydids, locusts, crickets, cockroaches, flies, moths, and even butterflies, and some Arachnida and Myriopoda, in a more or less irreconisable condition, frequently help to swell the unsavoury mass. But while these insects are decoyed and macerated, in order, as we may naturally infer, to help support the destroyer, there are, nevertheless, two species which are proof against its siren influences, and which, in turn, oblige it, either directly or indirectly, to support them.

The *Sarracenia* Moth.

The first is *Xanthoptera semicrocea* (Guen.) a little glossy moth, which may be popularly called the *Sarracenia* moth. It is strikingly marked with grey-black and straw-yellow, the colours being sharply separated across the shoulders and the middle of the front wings. This little moth walks with perfect impunity over the inner surface of the pitcher, which proves so treacherous to so many other insects. It is frequently found in pairs within the pitchers soon after these

open, in the early part of the season or about the end of April. The female lays her eggs singly, near the mouth of the pitcher, and the young larva, from the moment of hatching, spins for itself a carpet of silk and very soon closes up the mouth by drawing the rims together and covering them with a delicate, gossamer-like web, which effectually debars all small outside intruders. It then frets the leaf within, commencing under the hood and feeding downwards on the cellular tissue, leaving only the epidermis. As it proceeds, the lower part of the pitcher above the putrescent insect collection becomes packed with ochreous excrementitious droppings, and by the time the worm has attained its full size the pitcher above these droppings generally collapses. This worm when fully grown is beautifully banded transversely with white and purple or lake-red, which Dr. Mellichamp poetically likens in brightness to the Tyrian dye. It is



XANTHOPTERA SEMICROCEA.—a, egg, enlarged, the natural size indicated at side; b, c, larva, back and side views; d, chrysalis; e, moth, normal form, with wings expanded; f, pale variety, with wings closed.

furthermore characterised by rows of tubercles, which are especially prominent on the four larger legless joints. It is a half-looper, having but six prolegs, and keeps up, in travelling, a constant restless, wavering motion of the head and thoracic joints, recalling paralysis agitans. The chrysalis is formed in a very slight cocoon, usually just above or within the packed excrement. The species, kindly determined by Mr. A. R. Grote, was many years ago figured by Abbot, who found it feeding on *Sarracenia variolaris*, in Georgia. Guenée's descriptions were made from these figures, for which reason I have made some descriptive notes from the living material. The species feeds alike on *S. variolaris* and *S. flava*, and there are at least two broods each year, the first brood of larvæ being found during the early part of May, the second towards the end of June, and disappearing with the dying of the leaves.

The *Sarracenia* Flesh Fly.

The second species is a still more invariable living accompaniment of both kinds of *Sarracenia* mentioned. By the time the whitish efflorescence shows around the mouth of the pitcher, the moist and macerated insect remains at the bottom will be found to contain almost invariably a single whitish, legless grub or "gentle," about as large round as a goosequill, tapering to the retractile head, which is furnished with two curved, black, sharp hooks; truncated and concave at the posterior end of the body. This worm riots in the putrid insect remains, and when fed upon them to repletion bores through the leaf just above the petiole and burrows into the ground. Here it contracts to the pupa state, and in a few days



SARCOPHAGA SARRACENIÆ.—a, larva; b, pupa; c, fly, the hair-lines showing average natural lengths; d, enlarged head and first joint of larva, showing curved hooks, lower lip (g), and prothoracic spiracles; e, end of body of same, showing stigmata (f) and prolegs and vent; h, tarsal claws of fly with protecting pads; i, antenna of same. All enlarged.

issues as a large two-winged fly, which I have described (*loc. cit.*) as *Sarcophaga sarraceniae*—the *Sarracenia* flesh-fly. The immense prolificacy of the flesh-flies, and the fact that the young are hatched in the ovaries of the parent before they are deposited by her on tainted meat and other decomposing or strong-smelling substances have long been known to entomologists, as has also the rapid development of the species.

The viviparous habit among the Muscidae is far more common than is generally supposed, and I have even known it to occur with the common house-fly which normally lays eggs. It is also possessed by some Cestrinæ, as I have shown in treating of *Cestrus ovis*, the sheep bot-fly. But the propensity of the larvæ for killing one another, and their ability to adapt themselves to different conditions of food-supply are not sufficiently appreciated. I have long since known, from extensive rearing of parasitic Tachinadæ, that when, as is often the case, a half dozen or more eggs are fastened to some caterpillar victim only large enough to nourish one to maturity, they all hatch and commence upon their common prey, but that the weaker eventually succumb to the strongest and oldest one which finds the juices of his less fortunate brethren as much to his taste as those of the victimised caterpillar. Or, again,

that where the food supply is limited in quantity, as it often is, and must be with insects whose larvæ are parasitic or sarcophagous, such larvæ have a far greater power of adapting themselves to the conditions in which they find themselves placed, than have herbivorous species under like circumstances. Both these characteristics are strongly illustrated in *Sarcophaga sarraceniarum*. Several larvæ, and often upwards of a dozen, are generally dropped by the parent fly, within the pitcher: yet a fratricidal warfare is waged until usually but one matures, even where there appears macerated food enough for several. And if the *Xanthoptera* larva closes up the mouth of the pitcher ere a sufficient supply of insects has been captured to nourish it properly, this *Sarcophaga* larva will nevertheless undergo its transformation though it sometimes has not strength enough to bore its way out, and the diminutive fly escapes from the puparium, only to find itself a prisoner unless deliverance comes in the rupture or perforation of the pitcher by the moth larva or by other means. This rupturing of the pitcher does not unfrequently take place, for Dr. Mellichamp writes under date of June 27, as follows: "Most old leaves now examined—I might almost say all—instead of being bored, seem ripped or torn, as if by violence, apparently from without. You see occasionally shreds of the leaf hanging. Surely the legless larva of *Sarcophaga* cannot do this!" What then—the toads, frogs, or crawfish abounding in these moist pine lands? or rather is not the fat maggot the occasion of the visits of the quail which lately I have observed here? These two insects are the only species of any size that can invade the death-dealing trap with impunity while the leaf is in full vigour, and the only other species which seem at home in the leaf is a minute pale mite belonging, apparently, to *Holothyrus* in the *Gamasidæ*, and which may quite commonly be found crawling within the pitcher; and a small *Lepidopterous* leaf-miner, which I have not succeeded in rearing. There must, however, be a fifth species, which effectually braves the dangers of the bottom of the pit, for the pupa of *Sarcophaga* is sometimes crowded with a little *Chalcid* parasite, the parent of which must have sought her victim while it was rioting there as larva. No other insect, so far as we now know, can crawl up the slippery belt—all tumble into the tube and there meet their death.

Means of Escape.

Certain questions very naturally present themselves here:—First, What gives the flesh-fly more secure foothold on the slippery pubescence than the common house-fly exhibits? Second, What enables the larva of the flesh-fly to withstand the solvent property of the fluid which destroys so many other insects? Third, What gives the *Sarracenia* moth and its larva security? I can only offer in answer the following suggestions:—The last joint of the tarsus of the common house-fly has two moveable sharp-pointed claws and a pair of pads or pulvilli. These pads were formerly supposed to operate as suckers, and all sorts of sensational accounts of this wonderful sucker have been given by popular writers, who forgot that there are any number of minute insects having no such tarsal apparatus, which are equally indifferent to the laws of gravitation so far as walking on smooth upright surfaces, or on the ceiling, is concerned. In reality, these pads are thickly beset on the lower surface with short hairs, most of which terminate in a minute expansion kept continually moist by an exuding fluid—a sort of perspiration. Take the soft human hand, moistened by perspiration or other means, and draw it, with slight pressure, first over a piece of glass or other highly-polished surface, and then over something that has a rougher surface, such as a planed board, a papered wall, or a velvety fabric, and you will experience much greater adhesion to the smoother objects, and may understand the important part which these moist pads play in the locomotion of the fly. They also act, in part, like the cushions of a cat's paw in protecting and preventing abrasion of the claws, which are very useful on the rougher surfaces, where the pads are less serviceable. Now, compared with *Musca domestica*, the claws of *Sarcophaga sarraceniarum* are much the longer and stronger, and the pads much the larger, presenting three or four times the surface. These differences are, I think, sufficient to explain the fact that while the common fly walks with slippery and unsteady gait on the smooth pubescence (the retrorse nature of this pubescence sufficiently explaining the downward tendency of the movement), its sarcophagous congener manages to get a more secure footing; for not only does the latter present a larger adhesive surface, but the longer claws are more likely to reach beyond the pubescence and the bristles, and fasten to the cellular tissue of the leaf beyond. Moreover, *Sarcophaga* is more thickly beset with stiff spinous bristles than *Musca*, and Dr. Mellichamp says that when disturbed it buzzes violently about, just as if an animated sheep-bur had fallen into the tube—not apt to go down, because it will hitch and stick, and finally, by main force, it generally emerges, but sometimes also succumbs. In answer to the second question, I can only say that there is nothing exceptional in the power of the larva to withstand the solvent quality

of the fluid; it is, on the contrary, in accordance with the facts known of many species of *Muscidæ* and *Estridæ*, some of which, like the well-known horse-bot, revel in a bath of chyme, while others are at ease in the intestinal heat of other warm-blooded animals. It is also well known that they will often live for hours in strong liquids, such as alcohol and turpentine. In answer to the third question, the moth is doubtless assisted in walking within the tube by the spine and spurs on the legs which it, in common with most other moths possesses; the tarsi in *Xanthoptera* being armed with spines, and the spurs being quite long, and in *semicrocea* usually shod at tip with a corneous point. Its larva overcomes the treacherous surface by either carpeting it with silk, or destroying it. To one accustomed to seek the why and wherefore of things, the enquiry very naturally arises as to whether *Xanthoptera* and *Sarcophaga* play any necessary or important rôle in the economy of *Sarracenia*. Speaking of the *Sarcophaga larvæ*, Mr. Ravenel asks, "May he not do some service to *Sarracenia* as *Pronuba* does to *Yucca*?" And if so, may not all this structure for the destruction of insects be primarily for his benefit? Can he be merely an intruder, sharing the store of provision which the plant, by ingenious contrivance, has secured for itself, or is he a welcome inmate and profitable tenant? Self-fertilisation does not take place in *Sarracenia*, and the possibility that the bristly flesh-fly aids in the important act of pollination, lends interest to the facts. No one has witnessed with greater pleasure than myself the impulse which Darwin has of late years given to such enquiries; but we should be cautious lest the speculative spirit impair our judgments, or our ability to read the simple lesson of the facts. My own conclusions summed up are:—1. There is no reason to doubt, but every reason to believe, since the observations of Dr. Mellichamp, that *Sarracenia* is a truly insectivorous plant, and that by its secretions and structure it is eminently fitted to capture its prey. 2. That those insects most easily digested (if I may use the term) and most useful to the plant are principally ants and small flies, which are lured to their graves by the honeyed path, and that most of the larger insects, which are not attracted by sweets, get in by accident, and fall victims to the peculiar mechanical structure of the leaf. 3. That the only benefit to the plant is from the liquid manure resulting from the putrescent captured insects. [Mr. Ravenel, in making a transverse section near the base of the young leaf, noticed large tubular cells passing down through the petiole into the root, and much of the liquid manure may possibly pass through these into the root stalk.] 4. That *Sarcophaga* is a mere intruder, the larva existing on and sharing the food obtained by the plant, and the fly attracted thither by the strong odour, as it is to all putrescent animal matter or to other plants, like *Stapelia variegata*, which give forth a similar odour. There is nothing to prove that it has anything to do with pollination, and the only insect that Dr. Mellichamp has observed about the flowers with any frequency is a *Cetoniid* beetle—the *Euryomia melancholica*—which, with other species of its genus, is commonly found on many different flowers. 5. That *Xanthoptera* has no other connection with the plant than that of a destroyer, though its great injury is done after the leaf has performed its most important functions. Almost every plant has its peculiar insect enemy, and *Sarracenia*, with all its dangers to insect life generally, is no exception to the rule. 6. That neither the moth nor the fly has any structure peculiar to them that enables them to brave the dangers of the plant, beyond what many other allied species possess.

Russian Bast Mats.—About 400,000 mats are annually exported from the port of Archangel alone, and large quantities also reach us by way of the Baltic and Black Sea. The exportation in this way amounts to about a million and a half of mats a-year. The home consumption cannot be given in exact figures, but there is no doubt that it greatly exceeds the quantity exported. The manufacture of mats is mainly a domestic industry. The peasants employ their spare time in the maceration and separation of the liber of the Lime tree into slips, and in plaiting the latter into mats, which are purchased wholesale by commissionaires. Lime trees from twenty-five years of age are fit for decortication for the manufacture of mats, and in localities where the Lime is not sufficiently plentiful to supply the wants of the inhabitants in the way of mats and shoes it is replaced by the bark of the Willow and Birch. Indeed, in the Government of Kostroma, one of the principal centres of this industry, the Lime forests are already all destroyed, so that the materials to carry it on have to be procured from other districts, for the inhabitants are loth to give up an occupation which has been continued for centuries. The bark is removed in spring or early in summer, about three weeks being devoted to this part of the work. The value of the mats exported to Europe in 1871 amounted to nearly £50,000.

TREES AND SHRUBS.

THE SCOTTISH PINE.

A WRITER in a weekly contemporary says:—"The Scottish Pine appears to thrive in deep valleys, and to grow equally well on the mountain side. Finer examples of these trees may be found on almost any English estate than their native woods affords." The writer of this paragraph can only be very imperfectly acquainted with the Scottish Pine in its native habitats. He cannot have traversed Glenmore, and looked upon the remnant of the noble trees that once occupied that celebrated glen. Their glory has departed; but a feeling of awe and regret passes through the mind as one looks upon the skeletons of the mighty dead which have been torn and worn by the tempests of centuries. Where are their equals to be seen, living or dead, on any estate in England? I would advise the writer referred to go to Badenoch, and see "the giants," "whose statures reach the sky," to use the words of the late Professor Wilson, who had seen more of Highland scenery than most men of his day. I am sure that his opinions will undergo some modification. A resident on the banks of the Spey in olden times, who had the opportunity of seeing the timber rafts floated down that rapid river to the sea, would have smiled at seeing such absurd statements made. The mighty tenants of Abernethy had reached the sea before my days, but I have often stood on the banks and watched the remnant of those noble trees that were floated down the river from time to time. Sixteen square miles of the forest Rothmurchus has gone to the ground. The axe has been busy in many a magnificent Scottish forest, but a mass of timber still remains, as anyone may see who traverses the course of the Dee, the Spey, and the Findhorn, besides many a strath and glen whose dark recesses are made still more sombre by the trees of the native Pine. Pure air and drainage it must have to bring it to that perfection in which it may yet be seen while clinging to the almost naked rocks in many of the highland glens. In the valleys where the air is moist, the bole of the trees are sometimes grey with lichens; but higher up, where the air is more rarified, their smooth trunks are often of that deep flesh colour that gives them such a striking appearance at a distance. That there are many fine specimens of the Scotch Fir in the parks and plantations of England, and in the Lowlands of Scotland, I do not deny; "but people who have seen it in its native climate and soil, and who judge of it from the wretched specimens which are suffocated in English plantations, with their roots in heavy and eternally wet clays, may well call it a wretched tree, but when amongst its own Highland Heather, and standing freely in its native knoll of dry gravel, or thinly-covered rock, over which it spreads its network of roots, its appearance is far different." It is astonishing how rapidly the Pine shoots up to the size of a tree in many parts of Scotland, but it requires generations to bring it to perfection, and it will require time to solve the problem whether the immense planted Pine woods in Scotland will ever equal in size of timber and quality the ancient forests of that country. The writer referred to remarks that "It would be a prudent and proper course for the Government to insist on the preservation of a few acres of the best trees in each district as seed parents for future forests;" but he does not say whether naturally-planted trees ought to be preferred to artificially-planted trees. He does, however, refer to miniature and decrepid specimens, left on account of their inferiority, which, he says, are prone to produce cones more abundantly, and become the parent stocks of future forests, thus perpetuating degeneracy. I am not in a position to say whether the nurserymen in the north of Scotland, that raise such enormous numbers of seedling Pines, gather their seeds from such trees or not; but should this be really the case, it would be well for planters and for those nurserymen that purchase quantities of one-year-old seedlings from northern growers to enquire into the matter. That stunted Pine trees bear cones freely cannot be questioned; but that they are more prolific than fine old full-grown trees, no one really acquainted with the Pine would maintain. This is not a question for Government intervention, but for landed proprietors and those interested in the commercial value of timber trees. A rather singular thing regarding the propagation of the Pine by seed came under my own observation some years back. I noticed a number of rocks carrying what appeared to be Potatoes in their bills to a bare rocky knoll, then carefully burying them in the earth. On examination, instead of Potatoes, I found them to be Fir cones. For what purpose the rocks buried them there I am unable to say, but only conjecture that they placed them there as a provision for winter use during heavy snows. The spot became, in a short time, covered with fine young Firs, and is now densely covered with trees. In traversing the highland glens and extensive woodlands of the north of Scotland my own impression was that a great natural renovation was taking place. I have noticed, on some of the highest mountains,

Fir trees embedded in the peat. How many ages have passed away since those trees reared their heads aloft I am unable to say, but ever since they were laid low by fire or some great convulsion of Nature, the soil where they grew has been undergoing a natural preparation to receive their successors. The rapid growth of the Fir, where it has been extensively planted in the north, is a proof of what I state. It is impossible to conceive the extent of the ancient Scotch forests until one carefully examines the mountains and hills now bare and treeless. Where the relics of the trees that once flourished upon them lies concealed in the soil or peat, and it is very evident that if these extensive wastes are to be clothed with verdure, the hand of man must do it. "Be aye sticking in a tree, Jock?" was the Laird of Dumbiedyke's advice to his son, and the advice should not be lost upon the present generation of Scotchmen, who, by adding to the Fir woods of their country, enhance the value of the cultivated land, and add also to the beauty of the district. J. T.

SPINDLE TREES.

A large proportion of these species are hardy enough for cultivation in Britain, and are now frequently met with either in the open shrubbery or on walls, for which some of the more tender of the evergreen sorts, from their free growth and beautiful foliage, are admirably adapted. All the species have small and inconspicuous flowers, with little beauty to commend them to the attention of cultivators; but this defect is amply compensated for by their fine foliage, handsome habits of growth, and the bright showy fruit which some of the sorts produce in abundance in autumn and winter. They grow well in almost every variety of soil, but are most luxuriant in such as are rich in vegetable matter, such as peat or decayed leaves, and, as a rule, they prefer open sunny situations to exposed ones, particularly the evergreen sorts. They all thrive well in the vicinity of the sea, particularly the deciduous sorts. The following are among the most distinct and desirable of the species and varieties at present in cultivation:

Euonymus europæus (the common Spindle tree).—This is indigenous to England, as well as to a wide area on the Continent of Europe, and is a deciduous bushy tree, varying in height from 10 to 25 feet. The leaves are of a warm green colour, changing as they decay to a reddish tint. When bruised they have a disagreeable odour. Its small greenish-white flowers expand in May, and are followed almost always by an abundant crop of fruit, produced in bright pink capsules, which opening up in the autumn, reveal the orange-coloured sac which envelops the seeds, producing a strikingly beautiful effect. This tree is deservedly popular in shrubbery borders and in ornamental plantations. It always looks best when trained up for a few feet from the ground to a single stem, the upper branches being allowed free scope, or at least only pruned sufficiently to give it a trim tidy appearance. It is scarcely necessary to add that it is one of the hardiest of the group, and that it succeeds well near the sea. Of several varieties, the most interesting are the white fruited kind, which differs from the species in producing white instead of pink capsules; the variety with scarlet leaves; and *nanus* or *pumilis*, a neat little plant, very bushy, and one which never grows higher than about 2 feet, and it is admirably suited for a rock-garden, or any situation where a compact dwarf-plant is desirable.

E. latifolius (the Broad-leaved Spindle tree).—This is another European species, found wild in the south of France and in some parts of Germany, and is a deciduous tree of from 10 to 20 feet high. The bark on the young wood is of a reddish-green colour. The leaves are bright shining green, and much larger than those of the common *Euonymus*. The flowers, which expand in June, are of a purplish-white; the capsules large, and deep red, contrasting, as they open, most effectively with the bright orange sacs or arils, with which the seed is enveloped. It is quite hardy, but thrives best in moderate shelter, and forms an exceedingly ornamental tree, well fitted for a lawn or small park, as well as for associating with evergreens in the mixed shrubbery border.

E. americanus (the American Spindle tree).—This is a small deciduous, or, in mild winters and sheltered situations, sub-evergreen shrub, of about 6 feet in height, found wild over a wide area in Canada and the United States. It has an erect habit of growth, with numerous long slender branches covered with a smooth light green bark. The leaves are of a deep shining green. The flowers expand in June, and are succeeded by rough warted brilliant crimson capsules, which, in its native habitats are so showy and abundant that it is popularly called the Burning Bush. In this country it is generally cultivated as a wall plant, and as such it is very ornamental. It succeeds best on the shady side, and prefers a moist rather than a dry porous soil.

E. angustifolius (the Narrow-leaved Spindle tree).—This is also indigenous to North America, and is found in similar localities as

the preceding. It is a recumbent twiggy evergreen or sub-evergreen shrub of about 4 feet in height. It has long wiry branches, abundantly clothed with remarkably narrow oblong leaves, of a deep green colour in summer, changing in autumn to a dull red tint. The flowers are very small, of a greenish-white colour, followed by red fruit capsules, which are, however, neither produced in sufficient quantity here, nor conspicuous enough individually, to give the plant a feature. It is, nevertheless, a very distinct and interesting shrub for a low wall, and has a pretty effect on a rockery, growing freely in shady sheltered aspects, and in damp heavy soils.

E. japonicus (the Japan Spindle tree).—This is an evergreen species of from 4 to 6 feet in height. It has an erect bushy habit of growth, the branches being long and slender, and clothed with numerous ovate-formed leaves of a dark glossy-green colour. Though hardy, and of free growth, in sheltered districts it seldom or never produces flowers in this country—a defect, however, which is amply compensated for by its very attractive foliage. Few evergreens thrive better near the sea than this does; and either it, or some of its varieties, are frequently met with on the west and south coasts of England, and west coast of Scotland, growing in the greatest luxuriance, and forming handsome specimen shrubs on lawns and shrubberies. In the inland districts it is liable to suffer from very severe frosts, and can only be depended upon when enjoying the shelter of a wall or in favoured situations in the open ground. During recent years a considerable number of distinct varieties have been sent home from time to time from gardens in Japan; several of these, and particularly the following variegated forms, are already established favourites. All the sorts thrive best in warm sunny exposures, and in rich well-drained soils. The kind called *argenteus variegatus* has leaves clothed with silver; *aureus variegatus*, leaves blotched with bright gold; *ovatus aureus*, leaves margined with deep golden-yellow; *latifolius argenteus* and *latifolius aureus*, leaves with white and yellow variegations respectively; and *radicans variegatus*, a creeping-stemmed variety, seldom extending to a greater length than 2 feet; its leaves are freely variegated with white; it is very hardy, and useful for planting as an edging to flower-beds or front of shrubbery borders. On rockeries or low walls it has a pretty effect; and as it forms adventitious roots on the young shoots, similar to those of the Ivy, it requires little trouble in the way of tying or nailing to keep it to the wall or other support.—“The Gardener.”

Bad Writing and Illegible Signatures.—As the Parliamentary Session is approaching will you permit a suffering M.P. to make known a real grievance in which I feel sure that you will sympathise with me? I allude to the increasing illegibility of handwriting and the extraordinary pains that are taken by some people to disguise their signatures. I happen to have a large correspondence, and in other respects am not an idle man; but, if I were, I should still find occupation in the daily attempt to decipher some of the letters I receive. If the writers only knew what an irresistible temptation there is to throw their hieroglyphics into the waste-paper basket unread, they would be a little more careful to make their handwriting decently plain and legible. How can they expect that in the pressure of business, and with perhaps a dozen letters to read which are brought by a single post, a member of Parliament can find time to sit down and puzzle out the meaning of his correspondent as patiently as if he were trying to decipher the inscription on the Moabitish stone, or some new variation of the cuneiform character. But it is chiefly with the signature that fantastic tricks are played. Often do I gaze hopelessly at the cabalistic sign which does duty for that office, and try every ingenious device to enable me to divine who it is that addresses me. I take my family into council and submit the curious symbol to my wife and daughters, who sometimes are able to solve the riddle and rescue me from my dilemma, but who are often as helpless as myself. I cannot always have Mr. Netherclift or Mr. Chabot at my elbow, and I have been driven to the expedient of cutting off the signature and posting it on the envelope which contains my reply. I thus throw upon my noble friend, the Postmaster-General, the responsibility of finding out the name of my correspondent. There is one secretary of a company in London—yes, a secretary—who signs his name in a way which is unintelligible and ridiculous. Now, why should this be? It has been said that language was given to conceal our thoughts, and some people seem to think that signatures are meant to hide our names. A drunken spider crawling out of an ink-bottle would really give as much information as the flourishes and dashes and rigmarole caricatures which they intend to stand for letters. I wish I could except the fair sex altogether from the charge of caprice in signatures, but I cannot, although in this respect they do not sin so much as men. Pray, Sir, say something to induce people to write plainly, clearly, and legibly, and you will confer a boon upon others besides an M.P.—“Times.”

GARDENING FOR THE WEEK.

Flower Garden and Pleasure Grounds.

LAWNS seldom look fresher or more beautiful than at present, and for some time to come all that will be necessary in order to keep them in good condition will be an occasional sweeping and rolling. Mossy lawns are sometimes objected to, and where such is the case the present is a favourable time for endeavouring to eradicate the Moss, an operation which may be accomplished by means of a sharp-toothed iron rake; with this drag the Moss to the surface, when it should be cleared carefully off, and a portion of lawn Grass-seed (which may be procured ready mixed from any seedsman) should be sown carefully over the cleared surface. After that a slight surface dressing of any finely-sifted rich soil should be applied, and well stirred in with an iron rake, and the whole should then be repeatedly rolled. Under trees, however, or in any other situations where Grass does not grow well, the Moss should not be disturbed; on the contrary, it should rather be encouraged. Continue to frequently roll gravel walks and drives in order to keep them in good condition, and occasionally refresh the surfaces of beds of spring-flowering plants, which will now begin to be attractive. Prepare beds in which to plant *Ranunculuses* and *Double Anemones*, and push on as rapidly as possible the propagation of summer bedding plants, keeping store pots containing *Ageratums*, *Bouvardias*, *Verbenas*, *Lobelias*, *Petunias*, *Coleuses*, *Iresines*, and similar plants in a gentle bottom-heat, in order to induce them to furnish abundance of strong healthy cuttings. When sufficient of the latter have been secured, the autumn-struck cuttings may be thrown away, as those struck in spring are generally to be preferred, unless it be in the case of such plants as the various kinds of bedding *Pelargoniums* and *Calceolarias*. A very brisk heat is necessary to induce the *Alternantheras*, more particularly *A. amoena*, to furnish cuttings at an early period in the spring. But unless it be in cases where a very large stock of these plants is required, a high temperature need not as yet be applied to them, as when growth, in their case, does commence, they quickly produce abundance of cuttings which will strike root in the course of a few days; and in their case, as in that of *Verbenas* and similar bedding plants, potting-off is unnecessary, as they may with advantage be allowed to remain in the cutting pots until required for planting out in the beds; and thus a very considerable amount of labour, as well as of pots and space, may be saved. In adopting this plan, however, it is advisable to use pots about 8 inches in diameter, and to let them be well drained, say to about one-fourth or fifth of their depth. Over this spread a thin layer of chopped moss or fibre, in order to prevent the soil from mixing with the drainage, and then pass some moderately rich light soil through a half-inch sieve, and with a sieve of, say, one-quarter inch mesh, sift from this the finer particles, and with the portion which will not pass through the meshes fill the pots to within two inches of the rim. Then with a compost, consisting of about equal parts well-decayed leaf soil finely sifted, and sharp river or silver sand, fill up the remaining 2 inches, and into this insert the cuttings, not too deeply. Each pot will contain from two to three dozen cuttings, more or less, according to their size. Place them in a mild bottom-heat, in a somewhat close moist atmosphere, and frequently sprinkle them until they are fairly rooted, when they may be removed to cooler quarters. Plants thus prepared must be shaken out of their pots at planting time, when their roots will be found to have laid firm hold of the portion of rough soil which was placed under the sandy compost, and this ought to be allowed to adhere to them as much as possible. They should then be planted at once somewhat thickly in the prepared soil of the beds, with a small setting-stick; and, should the weather prove dry, a little extra care as regards watering may be necessary. Plants, thus treated, will generally be found to succeed equally well, or better, than the same sorts turned out of small pots.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Orchids.

A rise of 5° in Orchid-houses this month will be beneficial to all re-potted plants. We must now pot and top-dress such plants as require that attention, and as a great deal depends on the freshness of the soil in securing a healthy growth, they must not be over potted. We seldom see healthy plants of *Epidendrum vitellinum*; yet, when it is well grown, this is one of the most useful of Orchids. It lasts many weeks in bloom, and its colour is so distinct as to contrast strikingly with that of its associates. It should have a temperature in the autumn and winter months from 50° to 55°, and should never be allowed to get dry at the root. On bright days its growths should be syringed. *Oncidium macranthum* will be growing freely this month, and great care will be required in watering to prevent the water coming in contact with the young growth, otherwise the flower-spike will be injured. This kind will grow in a temperature as low as 40° or 45°. *Odontoglossum Hallii* does well

in the same temperature, and will produce flower-spikes 3 to 4 feet in length, with twenty flowers on a spike. When seen like this, it is one of the most noble of our cool Orchids, and if it be possible to get it, should be sought after by importers. The same degree of temperature suits *O. nebulosum*, which should never be allowed to get dry at the root. When well grown and flowered this kind is very useful to arrange with others. *Calanthe Veitchii* and *C. vestita* should not be potted till they have made sufficient growth to render the young roots discernible. Two parts of strong loam, one part of old cow-manure, and one part of coarse sand and charcoal should then be used, and the pots placed in a temperature of 65° to 70°. Pot the favourite *Masdevallias* in equal parts of peat and Sphagnum Moss and a double quantity of coarse sand and charcoal. Always keep it well supplied with water, and maintain a temperature of 45° to 55°. *Pleiones* will require watering more freely this month, and must be syringed on bright days. *Dendrobiums* and *Cypripediums* that are making growth should have the warmest part of the house they are placed in, and must be syringed on bright days. Water should be used sparingly till they have established plenty of roots. Continue to keep *Disa grandiflora* plentifully supplied with water. *Coelogyne cristata* will now be in its beauty, as will also the section of *Cattleyas* to which *Trianae* belongs, as well as *Lycaste Skinneri* and its white variety, *Pilumna fragrans*, *Oncidium bicallosum*, *Dendrobium nobile*, *D. infundibulum*, *Laelia superbiens*, *Cypripedium villosum*, *Odontoglossum Bluntii*, *O. pulchellum*, *O. Hallii*, *Vanda suava*, *Phalænopsis grandiflora*, &c.—E. CULLEY.

Fern-house.

The first or second week in this month is a good time to go over Ferns, re-potting such as require it and top-dressing others, using good peat with a liberal admixture of coal cinders broken to the size of acorns; these are more effectual in keeping the soil open than potshreds. All tree Ferns grow quickest when their stems are syringed once or twice a day during their season of growth, but if they are required for the decoration of halls or for exhibition at times, it is better not to syringe, as the roots that are encouraged by syringing receive a check, in which case they are likely to be ruined. Large *Gleichenias* may be divided, but not into small pieces; plants, say in 18 or 20-inch pots, may be divided into two or four. Of all Ferns for mixing with flowers, either in vases or in bouquets, *Gleichenia Speluncæ* stands pre-eminent. It will last for a week in water. It is not advisable to cut small plants; but, when well managed, all the varieties are quick growers, and when the plants get large they will bear cutting in moderation with impunity. In large Ferneries, where most things are planted out, the selection and planting require judgment, in order that suitable varieties may occupy the positions for which they are best adapted, studying well what proportions each individual plant is likely to attain, quite as much as present effect, otherwise, instead of a satisfactory arrangement of these most elegant of vegetable forms, a confused jumble will be the result. Another important consideration is to have the plants free from insects, such as mealy bug or scale, otherwise endless labour will be entailed. Such kinds as *Adiantum Farleyense* and the *Gymnogrammas* require more heat during the winter than the majority of the occupants of the Fern-house, and it is better to remove such kinds for the winter to a slightly warmer house. The Fern-house during winter ought not to be kept at more than 50° night temperature, with a rise of 5° during the day. It is a mistake to use too much heat in the Fern-house, as it makes its inmates so tender that such as are required for cutting flag so as to be almost useless, and if the plants are required for decoration elsewhere they suffer as well as become unsightly. As soon as growth commences supply them liberally with water.

Hard-wooded Plants.

Bring all tying and training to a close as soon as possible, and prepare for potting all plants that require a shift towards the end of the month. Commence first with hard-wooded Heaths; half specimens and full-grown plants that require more root-room ought to be moved into pots 4 inches larger than those they at present occupy, for it is not desirable to re-pot these plants oftener than can be helped. See that the ball in all cases is sufficiently moistened before re-potting, so that watering may be avoided as long as possible after the operation. All newly-potted plants should be set at one end of the house, and do not admit more air at the end than can be avoided for three weeks or a month, keeping, at the same time, the stage damped with the syringe. Where there is not the convenience of separate houses for Heaths and for other kinds of hard-wooded plants, but where all have to be grown together, the Heaths ought, as far as possible, to be kept at one end, at which, except after recent potting, admit more air. After the potting of the Heaths is finished, commence with the other hard-wooded stock, using peat a little more

fibrous, or what is known among plant-growers as softer, than that which is used for the Heaths; but operating, in other respects, as recommended for those plants. Any additions that are intended to be made to the young stock of hard-wooded plants ought to be made forthwith, and all that require it potted on, giving to them pots 2 or 3 inches larger, according to the condition of the roots of each individual plant. All the plants, young and old, ought to have the potting completed as expeditiously as possible after it is once commenced, as then the whole can have what extra attention they require.

Indoor Fruit Department.

Vines.—Wireworms often prove destructive to the young Vines, as they devour the tender rootlets as soon as they are emitted, and frequently also any young shoots that are on the eyes at the time. It is difficult to trap them, but in the case of small pots, when the soil gets heated to 80° they generally come to the surface, when they may be removed and destroyed. If the soil used is in the shape of turves, or in boxes or beds, slices of Carrots placed here and there underneath the surface will be found to form good traps for them. The Carrots should be examined every morning and replaced until the whole are caught. If a small stake is pushed into every slice, it will form a handle by which the Carrot slices may be raised and examined. Wireworms will not remain long in company with ants, which attack and kill them. Keep the surface soil about young Vines free from weeds, and do not allow the surface to become pasty—on the contrary, keep it constantly free and open. If not already done, remove the weakest shoot from such “cut backs” as have pushed two shoots. As soon as the one left has reached a height of 18 inches, lift the pot out of the plunging material and set it on a dry surface in the Vinery, or in some pit in which a temperature of 70° is maintained. If retained in bottom-heat after this stage has been reached, they receive more harm than good. Although I do not approve of the system where any house of young Vines is intended to be an early one from the first, they should be planted about the second or third week in February, in order that they may be started into growth in time to be early ripened for a corresponding start the next and following seasons. I need hardly say that only Vines belonging to the Hamburg section should be chosen for such a purpose.

Pines.—Such plants in the first started batch of Queens as did not fruit well have been kept somewhat drier than the others during the last few weeks. A good watering should, therefore, now be given them; and, in all probability, they will show fruit in a short time. If not, do not neglect them, as they may be of good service in autumn. Other varieties may fruit while growing freely, but Queens do so reluctantly. A check to their growth is always necessary, in order to induce them to fruit, which appears before growth in the foliage begins. Admit fresh air to young plants on all favourable occasions, as it is very desirable to have their foliage partly hardened when the shortest days are past, and before lifting them into other pots has taken place. If it is necessary to make preparations for giving the young plants more room, old stumps from which the fruit has been cut may be removed. Suckers should, however, be carefully taken off valuable kinds, securing along with them as many as possible of such young roots as will be found clinging round the old stem. Such suckers will not suffer in the least if laid in by the heels amongst the plunging material until the Pines generally are shifted when they may be potted and plunged along with the others.—J. MUIR.

The Early Peach-house.—The fruit will now be set in the earliest house, and syringings morning and evening will be required in favourable weather. Attention should likewise be bestowed on the thinning of the fruit where they are set thickly, but this rarely happens when forcing commences so early. The disbudding of the shoots is a process best performed by taking off only a few of the strongest at different times, so as not to give a check to the roots. The temperature at night may be maintained at about 60°, with a rise to 70° by day, and by sunheat 6° or 8° higher. Green fly will begin to make its appearance, and the infected shoots must be picked off; but fumigation with tobacco will have to be resorted to at the last. The old system of fumigating hot-houses with the operator inside the house is now obsolete, and it was a cruel infliction on young gardeners and others who could not stand tobacco smoke. Some of the new patented fumigators are very efficient for the purpose; for, by making a hole in each door of the house for introducing their nozzles from the outside, the house can be soon quite filled with smoke, and kept so for any required time.

Fig-house.—Figs should be kept well watered and syringed with the night temperature at about 60°. When the young shoots have grown to the length of four or five joints, the terminal buds must be picked out to encourage the formation of a second crop.

Cherry-house.—The temperature must be kept low, from 40° to 50°, with plenty of air given on favourable occasions, until the fruit is set. After that they will bear more heat, with frequent syringings overhead, till the fruit colours.

Strawberries.—Occasional batches will want to be introduced into the pits or forcing-houses according to the consumption required. When sufficient fruit has been set on a truss, the rest of the blossoms should be picked off to strengthen the fruit left on. Liquid manure, if used twice a week, will help the fruit to swell, but it must be discontinued before the fruit begins to colour.

Cucumber and Melon-house or Pit.—The sun will now be more powerful, and, therefore, more favourable for forcing Cucumbers and Melons. A night temperature of from 60° to 65° is not too much, and the day temperature, by sunheat, may range to 80°. Maintain plenty of moisture on the pathways and plants, but beware of scalding draughts of steam by dashing water on the pipes or flues. Another sowing of seed may be made to supply the general stock of plants, for gardeners always find a good many friends begging Cucumber plants in March and April to plant in their frames.

Tomatoes.—This excellent fruit, if sown in the beginning of February and pushed on in heat, will ripen good crops in pots as early as May or June. The dwarf Orangefield is the best for this purpose. The Trophy and General Grant do not fruit so freely, and are later in bearing.

Kitchen Garden.

Sow a few seeds of Red Cabbage to succeed those sown in autumn. In some establishments Red Cabbages are used for other purposes besides pickling, and, therefore, it may be advisable to have a few coming in at various times to meet any demand that may arise. Plant early Potatoes on a warm dry border, where there is a good depth of rich soil. If they were placed in shallow trays as advised some time back, they will now be in good condition for planting; all growths, except one strong shoot, should be removed. In planting, either open trenches with the spade or draw rather deep drills with a long bladed hoe shaped like a carpenter's adze (a very useful tool for heavy soils), scatter a little thoroughly decayed manure along the bottom of the drills, place the Potato sets on it, and cover about 4 inches deep. Early Potatoes may be planted much closer to each other than later crops, and some pains should be taken to limit the growth so as to allow only one shoot to spring from each tuber; this alone will make a week's difference in the period of ripening, and make the crop more uniform in size. No crop pays better for liberal treatment, and where there is a scarcity of other manure, superphosphates may be profitably used for pushing on the growth and increasing the yield; about 7 or 8 lbs. per rod may be applied, sown in the drills with the Potatoes at planting time. Plant out now the main crop of Shallots and Garlic; only a small quantity of the latter is required in English establishments, but Shallots are largely used. Select a light dry situation on one of the quarters that have been laid up rough during the winter; burnt earth or charred refuse makes a good top-dressing to be mixed with the surface. Plant the bulbs in rows at a distance from each other of 1 foot, and 6 inches apart in the rows. In heavy land, avoid deep planting; simply press the base of the bulbs into the earth, and have ready a few bushels of light rich soil, in which burnt earth predominates, and place a handful in a small mound over each bulb. This will tend to secure them in the earth, and, being of an elastic nature, will offer no obstacle to their swelling to a good size, as the light coverings will crumble down to the natural level as the season advances. Make a further sowing of Peas; Dickson's First and Best is a very prolific kind, coming in a few days later than Ringleader. Huntingdonian may be sown at the same time for succession; this is the best of the Champion of England type I have yet seen. Long-pod and Green Windsor Beans may also be planted; the latter variety is generally the most esteemed, on account of its beautiful green colour, for the main crop. Beans sown last month in boxes under glass must be thoroughly hardened off by removing the lights whenever the weather is favourable. The same remark also applies to Peas that are now waiting in cold frames; transplanting Peas and Beans in this way has a tendency to induce early maturity, which, with the earliest crop, is of more importance than heavy and continuous bearings, as in most places the second sowing follows so closely on the heels of the first as to render that unnecessary. Sow the round-leaved Spinach between the rows of Peas every two or three weeks, and frequently stir the soil amongst the autumn-sown crop to encourage its growth, as there is usually in most places a large demand for this wholesome vegetable. Parsley may be sown any time this month, either in beds or as an edging to borders; sow in shallow drills thinly, and cover with light rich soil. In covering small seeds any little trouble incurred in this way will be amply repaid by a plentiful crop.—E. HOBDAV.

THE ELEPHANT HAWK MOTH.

THIS moth (*Chœrocampa elpenor*) is tolerably common throughout England. The larvæ feed naturally on Willow Herb (*Epilobium*) and on Bedstraw (*Galium*), but in gardens it confines itself chiefly to plants belonging to the natural order *Onagraceæ*, which are probably its proper food plants; for though Bedstraw is said to be one of them, and though I am aware, from personal observation, that it will feed and do well on this kind of plant, still it is usually found upon those of the same order as Willow Herb. It is very frequently met with on the *Fuchsia gracilis*. These caterpillars were discovered in this neighbourhood (South Wales) last year, in some numbers, on Fraser's Evening Primrose (*Oenothera Fraseri*), a plant brought here from North America in 1811, and no doubt it may be found on the common Evening Primrose (*Oenothera biennis*), and on plants of the same order, such as Enchanter's Nightshade (*Circæa Lutetiana*). The Elephant Hawk moth is a very remarkable caterpillar in appearance; it is 3 inches long, or more, the anterior segments being much smaller than the posterior ones, and the head smaller than the second segment. The colour is either brown or green, and is variously mottled and marked with black, the marks along the back forming an almost uninterrupted dorsal line; on each side of the fore part of the body are two dark round marks, in the upper part of each of which is a white kidney-shaped mark. From its large size and strange appearance it is sure to attract the eye of the most casual observer. It occurs in such very limited numbers that it is not likely to do much damage to our gardens, unless it attacks some choice plants of the *Oenothera* or *Fuchsia* tribe. The moth flies in June, and is a very beautiful object; the fore wings are much pointed, their colour is olive-green, tinted and shaded with pink; the hind wings are black at the base, shading off to the same delicate pink at the hind margin, which is edged with white; the body is of the same olive-green colour as the fore wings, and is tinged and marked with pink. OWEN WILSON.

ACREAGE OF ORCHARDS, MARKET GARDENS, &c.

ACCORDING to a Blue Book return, just published, the following is the acreage under orchards, market gardens, nursery grounds, and woods in each county in England, Scotland, and Wales, in 1874:

COUNTIES.	ORCHARDS, &c. Acreage of arable or Grass lands, but used also for fruit trees of any kind.	MARKET GARDENS. Land used by market gardeners for growth of vegetables and other garden produce.	NURSERY GROUNDS. Land used by nurserymen for growing trees, shrubs, &c.	WOODS. Coppices, or plantations, excepting gorse land and garden shrubberies.
ENGLAND.	Acres.	Acres.	Acres.	Acres.
Bedford	377	729	16	10,394
Berks	1,315	221	156	30,780
Buckingham	1,637	219	71	24,486
Cambridge	1,055	567	122	5,035
Chester	1,203	774	381	11,921
Cornwall	4,180	877	71	26,374
Cumberland	205	187	141	24,380
Derby	606	357	362	23,406
Devon	24,312	913	416	66,191
Dorset	3,416	162	135	29,388
Durham	155	483	33	21,904
Essex	1,055	4,164	352	29,061
Gloucester	11,152	1,081	220	41,295
Hants	1,077	992	166	87,229
Hereford	21,534	32	127	34,885
Hertford	1,197	231	408	20,714
Huntingdon	335	345	47	2,582
Kent	11,186	4,064	575	78,164
Lancaster	1,724	939	357	34,516
Leicester	541	288	113	9,688
Lincoln	1,188	505	118	35,444
Middlesex	2,616	5,368	459	3,174
Monmouth	2,451	171	31	28,584
Norfolk	1,346	905	116	44,251
Northampton	569	281	181	24,142
Northumberland	176	430	82	31,221
Nottingham	1,469	407	186	23,640
Oxford	805	221	72	15,563
Rutland	28	37	9	3,094
Salop	2,659	57	114	39,669
Somerset	19,857	842	211	39,658
Stafford	844	631	255	33,101
Suffolk	1,077	329	100	32,562
Surrey	1,681	1,601	1,309	48,094
Sussex	1,559	823	427	101,331
Warwick	828	359	99	18,529
Westmoreland	159	12	18	15,845
Wilts	2,163	231	82	40,419
Worcester	13,390	1,503	282	16,904
York { East Riding	554	461	197	11,357
North Riding	757	283	154	46,020
West Riding	1,224	1,602	474	60,740
Total for England	145,622	34,689	9,245	1,325,655

COUNTIES.	ORCHARDS, &c. Acreage of arable or Grass lands, but used also for fruit trees of any kind.	MARKET GARDENS. Land used by market gardeners for growth of vegetables and other garden produce.	NURSERY GROUNDS. Land used by nurserymen for growing trees, shrubs, &c.	WOODS. Coppices, or plantations, excepting gorse land and garden shrubberies.
SCOTLAND.	Acres.	Acres.	Acres.	Acres.
Aberdeen ...	49	556	202	93,339
Argyle ...	16	8	25	45,641
Ayr ...	60	97	143	22,145
Banff ...	10	3	9	26,199
Berwick ...	22	37	17	12,919
Bute ...	—	13	10	3,004
Caithness ...	—	3	—	440
Clackmannan ...	11	22	—	2,044
Dumbarton ...	7	8	—	8,388
Dumfries ...	38	19	120	27,472
Edinburgh ...	72	775	601	10,320
Elgin or Moray ...	22	10	89	45,368
Fife ...	22	57	27	22,003
Forfar ...	30	146	115	31,857
Haddington ...	46	306	11	9,439
Inverness ...	18	5	43	118,813
Kincardine ...	5	9	5	23,153
Kinross ...	—	1	—	3,551
Kirkcudbright ...	29	16	28	17,349
Lanark ...	453	137	45	20,862
Linlithgow ...	—	14	10	4,719
Nairn ...	2	—	1	14,346
Orkney ...	—	—	—	—
Shetland ...	—	—	—	—
Peebles ...	—	4	12	9,041
Perth ...	789	265	94	83,525
Renfrew ...	78	155	60	5,481
Ross and Cromarty ...	10	4	10	33,452
Roxburgh ...	57	46	64	13,387
Selkirk ...	3	2	—	2,973
Stirling ...	44	23	74	11,156
Sutherland ...	—	—	—	7,296
Wigtown ...	12	—	53	4,832
Total for Scotland	1,910	2,741	1,868	734,490
WALES.				
Anglesey ...	5	3	4	1,198
Brecon ...	826	5	107	9,233
Cardigan ...	19	4	19	11,257
Carmarthen ...	104	39	101	15,577
Carnarvon ...	142	81	110	6,757
Denbigh ...	206	107	43	13,512
Flint ...	123	19	18	5,375
Glamorgan ...	593	155	60	19,864
Merioneth ...	44	5	66	10,685
Montgomery ...	293	13	37	18,873
Pembroke ...	47	45	1	5,969
Radnor ...	592	1	64	8,523
Total for Wales ...	2,994	477	630	126,823
Total for Great Britain ...	150,526	37,907	11,743	2,187,078

THE FERNS OF BRISBANE.*

By Mr. ROBERT GRIEVE.

EVERY riverside within twenty miles of Brisbane is skirted with Ferns to a breadth varying from a few yards to a few miles. Dense, moist, gloomy, the nocturnal mosquito here hums its war-song at noonday. Here around us, closely packed, are many fantastic forms of plant life—the large parasitic Fig-trees of various kinds, the Red Cedar (*Cedrela Toona*), the gigantic Nettle (*Urtica gigas*), and the Seaforthia Palm. At our feet are various growths analogous to the Maranta and the Caladium. Above our heads are festoons of creepers, while at every step our progress is impeded by some Wait-a-bit Thorn, or the Vines or Lianes that bind the whole together. Such are the localities which produce some of our finest Ferns. First of all is the tree Fern (*Alsophila*), which rises to the height of 30 or 40 feet. I only know of one species, although hardly at the skirts of the wood is its congener, the *Dicksonia dubia*. Of the *Pteris* genus we have four species. Around us is the *Pteris tremula* with its polished ebony shafts. Then comes the still larger and most graceful plant, the *Pteris vespertilionis*, rising to a height of 10 feet, and delicate in the texture of its leaflets as a sensitive plant. The two other *Pteris* are not found in the same locality; we find them in the open country and elsewhere. They are the inevitable *aquilina*, and the more rare *Pteris longifolia*. As we painfully force our way through the forest, we tread on the two interesting little Ferns, the *Pellaea-paradoxa* and *falcata*. On that rotting tree-stump hard by twine in brotherly love the two small *Niphoboli*—

* Read before the Edinburgh Botanical Society.

confluens and rupestris. We next come upon a plant, the only one of its genus with us, the *Atlantodia australis*. Proceeding on over the rich loose leaf mould that we unsettle with our feet as we walk along, we come upon a most graceful Fern, well calculated to be an ornament to every conservatory, the *Nephrolepis exaltata*. Another *Nephrolepis*, the *obliterata*, may be seen adhering to some rocks outside the forest, and insinuating its polished roots here and there among the loose stones, pure of any soil. Outside the forest, and close beside it on its stony habitat, is that very curious plant, the *Drynaria diversifolia*. These are withered Oak leaves adhering to that Fern, one would say in passing. But they are not. They are the first produced pinnatifid unfertile fronds, always desiccated, of that tall feathery *Polypodium*, to which they adhere. Try to drag the plant from its rocky matrix. Impossible. To obtain it, you must take the rock with it. But let us return to the forest. Every here and there, in a moist hollow of a dead tree, may be seen the *Nephrodium molle*, like an immense Prince of Wales's feather; and, still more common, and of a darker green, is the *Nephrodium decompositum*, of which there are several varieties. We have, besides, two other swamp-growing kinds of this plant, viz., *Nephrodiums*—*unetum* and *propinquum*. These, however, do not seek the shade. Allied to this genus, I may mention here the *Lastrea coriacea*. In the depth of the scrub, often growing in solid masses of many yards' extent, we find the dark green *Asplenium attenuatum*, conspicuous for its proliferous reproduction. There are several varieties of this Fern, some of them, perhaps, sufficiently distinct to deserve a separate name at some future time. In the meantime, I take leave to show the Society a Fern I myself discovered, which bears some superficial resemblance to the *Asplenium*, but is, perhaps, more closely related to the *Doodias*. I have shown specimens of each for comparison. A very much finer and larger species of *Asplenium* than the last, and one of our choicest Ferns, is the *fulcatum*. High over our heads, it grows in the hollows of the surrounding trees, from which it throws out its bunches of long dark green crescents; and it is generally obtained with some difficulty. So also is that other beautiful epiphyte, an *Asplenium* also, as it is sometimes called, the *Neottopteris australis*, a grand Fern, very much like what I believe is called the Bird-nest Fern by gardeners. It attains a size at which each leaf may measure 8 feet. Talking of epiphytes brings me to the *Davallia pyxidata*, the Hare's-foot Fern, a beautiful species that is common enough in our British conservatories. All these epiphytes grow in similar situations, mostly high up in the ragged branch hollows of the largest trees, sometimes at 20 feet, sometimes at 200 feet; and even at that distance such Ferns as the *Neottopteris* and the *Platyneria* loom out grandly through the gloom. The most beautiful of them all is, without doubt, the *Platynerium alciorne grande*. I was privileged at a late meeting of your Society to hear read a letter from Moulmein, in which this Fern was described as, I think, extending to 15 feet in breadth. I am glad to be able to some extent to corroborate this statement, having frequently seen it covering as much as 100 square feet, or about 12 feet by 8. Its general appearance is too well known to require description. We have also another species of *Platynerium*, which may not be so familiar to British botanists, viz., the *Alciorne longifolium*. It is a much smaller plant than its magnificent neighbour, and has a perfectly distinct fructification. In the grande, the fructification crosses the whole of the broad disc-like fronds devoted to that purpose, whereas the *longifolium* only bears seed upon the tips of its comparatively attenuated leaves. The *Polypodium tenellum* is a creeping Fern, it makes its way like the Ivy or the *Convolvulus* up the trunks of the trees, and adheres to its support by numerous fibres in the manner of the Ivy. It is the last of the forest Ferns that I shall name, and in doing so generally, I would have it to be understood that the nomenclature is given with diffidence. Passing out from the shade of the forest, we cross the broad meadows. Every here and there a gigantic Gum tree or Iron-bark (both *Eucalypti*) intercepts the vertical rays of the sun. We see around us the ubiquitous *Pteris aquilina*, and mixed with it is the similar but fairer Fern, the *Polypodium rugulosum*. The *Dicksonia dubia* also grows in compact and tall masses hard by. We also find the *Doodia aspera* on the stony ground. We have three *Doodias*, the *aspera*, *media*, and *caudata*, the latter two species seeking a moister habitat. By the shade of these rocks grow two pretty little Ferns, light in form but dark in colour, resembling one another, and yet distinct, the *Cheilanthes Sieberi* and the *Notholaena distans*. But let us get out of the sun over the broken banks of that streamlet not far off, and see what we can find. There, in all its beauty is the lightest, airiest, most herbaceous of all Ferns, the *Lindsaea microphylla*, not in single stalks, but in great bunches of transparent vegetation. In the shape of its leaf it recalls the *Sphenopteris affinis* of the coal measures. The other *Lindsæas* are growing near, in all five species, specimens of which are on the table

—*Lindsæa microphylla*, *L. Fraseri*, *L. linearis*, *L. trifida*, *L. heterophylla*. They form altogether a group matchless for grace and delicacy. In connection with this family, and true of all Ferns, the remark occurs to me of how unchangeably exact in soil, moisture, and exposure are the natural habitats of all Ferns. Thus, those *Lindsæas* grow all on poor, sandy soil, yet each requires its own particular degree of poverty, and each insists on its own proper quantum of moisture; so that, given the locality, the exact plant to be found there can at once be predicated. Talking of the pure sandy soil, reminds me of two very unique Ferns, which love the inhospitable sand, *Schizæa dichotoma* and *Schizæa bifida*. Their resemblance to the Grasses causes them frequently to be passed over almost unnoticed. By the shelving banks of this stream, or among its undergrowths, may be found all our three *Adianta*—fair, fairer, fairest—*Adiantum formosum*, *A. hispidulum*, and *A. assimile* (so called from its close proximity to the Maiden-hair of Europe). The Maiden-hair is partly shaded from the light by another Fern, the *Blechnum cartilagineum*, and nearly in the stream itself is the other *Blechnum*, *B. striatum*. This is a swamp Fern. It only remains for me now to name three or four other swamp Ferns, and I have done. Conspicuous among them for size and beauty is the magnificent *Todia barbata*. It has a large central crown of veneration enclosed in fifty fronds, each standing 8 or 10 feet high, and rich in its solid masses of purple seed. Then, not inferior in size, if somewhat in grace, is the large *Chrysodium anreum*, which only grows on the banks of tidal streams. A Fern that we must not forget is the *Lygodium microphyllum*. It is a creeper, and a plant of it may be seen trailing through the reeds and water plants for many yards, leaving everywhere a gay festoon as it moves along. A specimen of it is on the table. It superficially resembles the *Tropæolum canariense*, but is still more light and delicate. Lastly, we have our three *Gleichenias*, with their simple rudimentary seeds at the back of each frond, ready to drop off at a touch—*Gleichenia dicarpa*, *G. microphylla*, and *G. flabellata*. They are wiry and incompressible, but eminently graceful and light. With these I shall conclude this list of our Brisbane Ferns.

ECONOMISING CUT FLOWERS.

FLOWERS are so scarce at present that it may seem useless to talk of saving them and time enough to begin in spring; but, on the other hand, there ought to be no waste of flowers when they are so valuable, and forced flowers are very suitable for the use I wish to recommend them for. I observe a great waste of cut flowers—after being worn they are thrown away. Now, if those worn in the evening were cast into the bath or jugs of water, they would be refreshed, and many of them fit for use by morning again; and those worn in the early part of the day would be revived for evening. Many flowers and scented foliage give off much perfume when floated thus in water, and the result is a morning or evening bath of "sweet waters," more pleasant than any scented soap concocted by the perfumer. Living in a garden, and surrounded with flowers, the plan I recommend is daily practised. Because one can have any quantity or variety of flowers, it is no reason at all why they should be wasted, and the fresh perfume of the water is a cheap and pleasant luxury. Try the following next spring:—*Daphne Cneorum* and Sweet Briar; Yellow Azalea and Sweet Briar; forced Roses and Gardenias; Jonquils, Lily of the Valley, and Mignonette (forced); sweet-scented Geraniums, of sorts, and Pinks; Lilac and Narcissus poeticus; Syringa (Philadelphus); all Tea, summer (Cabbage and Portland), and Scotch Roses. No Attar of Roses comes up to these last double varieties; Heliotrope and Clove Carnations; Lavender, Aloysia citriodora, and other sweet smelling herbs; Jessamine and Lemon Thyme. Orchids would be delicious, I am sure, and one flower of certain varieties would perfume a large bath, but I have no experience of these. Stocks, Wallflowers, Honeysuckles, Lily of the Valley, and Mignonette, do not give off so much perfume as one would expect; why, I do not know. When forced, the two last are more powerful than when flowering in their natural state. Perhaps for true invigorating refreshment marine plants and sea water is the most delightful bath, but one may not always live by the sea, or on a rocky coast essential for the growth of sea weeds.

Wardie Lodge, Edinburgh.

F. J. HOPE.

Alonsoa myrtifolia (Roetzl).—The height of this plant is from 2 to 2½ feet; it is of a very vigorous growth, and exceedingly floriferous. The individual flowers are larger far than in any other species of this genus, and of a more intense scarlet than those of *Alonsoa linifolia*. It makes a very good pot plant, but, by reason of its strong growing character, it is principally adapted for large beds in the open ground, for which, on account of the showiness of its flowers, it will be of great service.—W. THOMPSON, Ipswich.

NOTES AND QUESTIONS.

[THE following notes and questions came to hand, or were answered too late for insertion in their several departments.]

Trichomanes radicans.—This, though frozen into a mass of ice which encrusted and buried it many inches deep for many weeks, thawed out as fresh and fine as anyone could desire.—J. BACKHOUSE, York.

The Virginian Creeper in Shrubberies.—In various nooks in the pleasure ground here we have the small-leaved variety of this plant festooned from tree to tree with wire. It has a pleasing effect in autumn when the leaves are changing colour.—T. P. T., Wicklow.

Mistletoe on Mistletoe.—Dr. Masters showed recently, at the Scientific Committee of the Royal Horticultural Society, specimens from Mr. Corderoy, of Didcot, in which young seedling Mistletoes had grown upon the parent plant.

Varnish for White Woods.—Dissolve three pounds of bleached shellac in one gallon of spirits of wine; strain, and add a gallon and a half more of spirit. If the shellac is pure and white, this will make a beautifully clear covering for white wooden articles.

Josephine de Malines Pear.—I have this fine late Pear now in excellent condition from a bush tree. It is one of the best Pears with which I am acquainted, and is especially valuable now, when other dessert fruits are getting scarce.—J. C. T. W.

Hardiness of *Sarracenia purpurea* and *Darlingtonia californica*.—These have stood the late severe frost here without any artificial protection, and only partially covered with snow, even when the thermometer registered under 2° at no great distance off.—J. BACKHOUSE, York.

Cotoneaster microphylla at Killruddery.—This answers admirably when planted and trained as a covering for old pollard and broken down trunks of trees. There is one here that is draping a fine old stump of an Oak some 30 feet high which is just made to form one of the most picturesque objects on the grounds.—T. P. T.

Large Conifers at Dropmore.—The largest Deodar at Dropmore (planted in 1834) is said now to be 65 feet high and 52 feet through; the trunk, at 3 feet from the ground, girthing 9 feet 7 inches. The finest specimen of the Douglas Fir (raised from seed sown about 1827 or 1828) is now 106 feet high, and the height of the famous Dropmore *Araucaria imbricata* is now 69 feet.

Trees and Shrubs at Killruddery.—Some time since a fine old upright Cedar blew down. I had occasion to remove the bottom part of it, and, measuring it 30 feet from the ground, found it to be 2 feet 9 inches in diameter. I did not pass the tape round the root or buttress, but it was of enormous dimensions. Bay and Common Laurel are of immense size in stem, the latter in some places forming quite a forest of timber.—T. P. T.

Orchids Without Orchid-houses.—I have a large plant of *Phajus grandifolius* growing here amongst a mixed collection, which, though it only receives ordinary attention, is bearing ten splendid spikes of bloom. It has been subjected to a temperature during the winter of only 50°, and will now be removed to the cooler air of the statue gallery, where last year it sustained no apparent injury.—T. P. T.

Home-raised Pot Vines.—Your correspondent "Vitis" (see p. 74) is fortunate in being able to supply not only his own establishment with such excellent home-raised pot Vines as those he describes, but also the trade. I have seen many an attempt made to grow pot Vines in large establishments, and that under the superintendence of efficient gardeners, too, but in every case the result has been anything but satisfactory. If failures were brought to light as successes are, they would, I apprehend, be greatly in excess of the latter, and I am confident that bought Vines are, in the end, not only the cheapest, but the most satisfactory.—W. LAURIE, Alva.

Lilium Thunbergianum Wilsoni.—This was figured in the "Florist" from a plant in the possession of G. F. Wilson, Esq. It is very distinct from all the Japanese Lilies known in England. The ground colour of the flower is of a reddish-orange colour, the central portion of each segment being of a golden-yellow, and the whole surface nearly to the edge marked over with dark coloured dots, similar to those of the Tiger Lily. The flower indeed may be described as having the general form and character of *L. bulbiferum*, the colour and spotting of *tigrinum*, and the golden band of *auratum*. It is one of the most beautiful hardy Lilies we have seen.

Spring Flowering Bulbs.—The following Crocuses, and other bulbs, are now in flower in Mr. Barr's grounds at Tooting, viz., *Crocus aureus*, rich golden-yellow, the flowers preceding the foliage; *C. susianus* (reticulatus) golden-yellow, exterior brownish-black; *C. Oliverii* (Aucherii, Chripanthus), rich orange-yellow; *C. stellaris*, rich golden-yellow, exterior striped blackish-brown; *C. luteus*, the large yellow of the garden; *C. sulphureus striatus*, sulphur-yellow, exterior striped black; *C. Imperati*, violet, exterior fawn, striped black; *C. Sieberii*, violet-purple; *C. versicolor* var. *Albertini*, pale purple with deeper stripes; *C. hadriaticus*, white, base of flower blue; *C. biflorus* of Parkinson, white, exterior striped purple; *Leucojum vernum*, white, tipped green; *Scilla sibirica*, intense blue; *Galanthus nivalis*, white; *G. plicatus*, the Crimean Snowdrop, white; *G. Imperati*, white; *Anemone blanda*, blue; *Eranthis hyemalis*, the Winter Aconite, yellow; *Triteleia uniflora* var. *conspicua*, white tinged porcelain; *T. uniflora*, var. *lilacea*, lilac-porcelain.—P.

Sowing Primrose Seed.—Mr. Frank Miles advises the sowing of Primrose seed as soon as it is ripe, but intimates that in his experience Primrose seed germinates in a very irregular manner, some of the seed starting very late indeed. This, I think, is the inevitable result of sowing the seed as soon as gathered, as some of it is then matured whilst a portion may be very imperfectly so, and if sown at once it is probable that a part may start soon enough to produce plants that will entirely stifle seeds that germinate later. I prefer to hold the seed over until the spring, keeping it thoroughly dry, and then sowing it about the month of February in shallow pans or boxes placed in a cool house. Under these conditions the seed germinates with more certainty, and the seedling plants soon get strong enough to be transplanted into the open air where they make good blooming crowns through the summer, and will assuredly flower in the ensuing spring. They would not accomplish more if the seed were sown the previous summer, whilst much trouble is avoided. I am pleased to find that Mr. Miles is largely cultivating the Primrose. It will prove to him a source of great pleasure. I have a large bed of strong seedlings just coming into bloom, and there is a promise of many very beautiful plants amongst them.—A. D., Bedford.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

ON THE GEOLOGICAL ASPECTS OF ROCK-WORK.

WHEN rock-work has to be erected for horticultural purposes it will always be found that success will be attained just in the proportion in which some broad principles, based on a study of Nature's own work of that kind, have been followed. Every lover of Nature must have envied her power of adorning rough stony nooks by means of a few of the commonest plants; a Fern or two and a little Moss convert a few weather-beaten rocks into objects of beauty which it has often been attempted to imitate—usually without success. Yet success is attainable in almost every case if sufficient attention be only paid to the rules which, it will be seen, are as sacred to the physical agents which model our scenery as they ought to be to every landscape gardener. It is a trite observation to say that what pleases us in Nature is the perfect fitness of things which pervades all her belongings. The most rugged, abrupt, and even grotesque rock-masses, when untouched by man, never repel us by a sense of incongruity; they may be pleasing or awful as the case may be, but we feel no hint of their being out of place. Who, on the other hand, has not seen a lovely view marred by some unintelligent human hand, whether its work took the form of a quarry, a statue, or a vase? The secret of the difference lies in the word "weather-beaten:" rain, the chief rock-sculptor, working uniformly, slowly, and gently, leaves to each stone, which it is fashioning, its proper character, models it according to its peculiarities of composition and structure—in short, uses it fitly; while men with the most artistic pretensions, and armed with ruthless tools, too often misuse their materials, engaged, as they are in their ignorance, in the hopeless task of making "silk purses out of sows' ears." The first great rule which it behoves constructors of rock-work to look to is one very easily followed and constantly broken, it is, that "your rockery should be characteristic of the part of the country in which it stands." That is to say, use chalk at Brighton and sandstone at Tunbridge, granite on Dartmoor, and trap near Edinburgh. This seems obvious enough, but the experience of every one must include cases where the reverse rule appears to have been acted on. Some "artists" have even carried their Philistinism in this respect so far, that the more they have succeeded in giving to their rock-work the appearance of a miscellaneous collection of mineralogical specimens from all parts of the world the better have they been pleased. The familiar burnt brick of the South of England and the slag and painted coke of the northern coal districts are better than these. It is needless to point out what are the rocks suitable for rock-work in the different parts of Britain; a walk in the country will show you the rocks, and a glance at any geological map will tell you their names. The second rule, not to be departed from, is one not so easy to adhere to as the last, but quite as important, viz.:—"The form of your rockery should be that which in Nature is assumed by the particular kind of rock of which it is composed." In order to appreciate the amount of careful observation which this rule renders necessary, we must consider what are the various agencies which, together, bring about on rocks the result which geologists know by the name of "weathering." Nature's mode of making her rocks weather-beaten requires such an amount of time, that we cannot attempt to imitate her in that respect; but, if we cannot use her means, we can copy her results. Now, the weathering of a rock depends, before all things, on the structure of that rock, on its composition, and on the manner in which it is exposed to rain, frost, wind, and the atmosphere itself, which are the great weathering and rock-carving agents. On many rocks water acts mechanically only; or, to be more accurate, its power of dissolving some rocks, such as quartz, is so limited, even when, as is almost always the case, it is charged with carbonic acid, that it is inappreciable, and may, for practical purposes, be left out of the reckoning. On a great mass of quartzite rock, for instance, the effect of rain would be of this kind. It could scarcely

dissolve any of it away; but it would insinuate itself in every crevice and fissure and crack with which such hard rock abound near the surface, and thence, by the help of frost, blasts to shivers, winter after winter, layer after layer of the tough rock, just in the same manner as it blasts the water-pipes of our houses. By observation it is found that every rock affects a more or less peculiar kind of fracture, so that, bursting splinters from them, as has just been shown, the lines of fissure are not arbitrary or accidental. They, like everything else in Nature, form part of a plan. Hence, a particular class of form is the result for each rock of the purely mechanical action of the weathering agent. In the case of quartzite, for instance, the fracture is "conchoidal," shell-shaped, concave and wavy; this, on a large scale, gives rise to peaks with somewhat hollow sides, ridged with sharp surrounded edges. It may serve as an example of simple weathering on a homogeneous, hard, and practically insoluble rock. Let us see what takes place with more complex rocks of which granite may serve as a representative. This rock is made up essentially of three minerals—quartz, felspar, and mica in various proportions. Now, here, the water, with its carbonic acid, will act not only mechanically, as in the case of quartzite, but as a powerful solvent and disintegrator. The fissures in granite are large and continuous, taking the form of immense joints, which cross and re-cross each other often but not always, in a regular manner; but, besides these large lines of weakness, which affect the whole rock, there are the minute lines which separate the constituent minerals from one another. Into all these the water trickles, decomposing the granite along the joints and cracks, "widening them, and rounding off the angles of their intersections, and, ultimately, only the harder masses, or the hearts of the blocks defined by the joints, remain as solid crystalline granite; some, though a little, of the quartz is dissolved away by the water; the iron which is usually present in small quantities in granite "becomes oxidized, and weakens the rock; but it is chiefly the felspar that is decomposed by the action of carbonic acid, the alkalis are removed, and its residue is washed away in the form of fine china clay. . . . The quartz crystals remain as sand; the mica remains, but is less observable, and is partially decomposed." (Professor Rupert Jones.) It is by processes such as that just described that the many fantastic shapes assumed by granite rocks have been arrived at, whether they be those of the curious balanced "Logging stones" of Cornwall or Brittany, the bare rounded tors of Devon, or the grey sterile mountain tops of Aberdeenshire. All felspathic rocks of eruptive origin, such as porphyries, are moulded into the shapes which they now exhibit in the same way as granite, and such also is the case with those sedimentary rocks which consist, to a considerable extent, of felspar, such as many of our gritstones. In these, however, a greater uniformity of weathering is caused by the regular lines of bedding which take the place of the horizontal joints of the former class of rocks. The vertical joints are similar in both. In igneous rocks, such as basalt and greenstone, the jointing and fissuring is often of such a kind as to give rise to very striking effects, very various in their appearance, though probably closely allied in their origin. Thus, from the simple dark brown, or black trap, without apparent structure, forming shapeless masses of a rounded, somewhat unpicturesque outline, there is but one step to the bold semi-columnar escaliments of trap, which are so conspicuous in Northumberland and in many parts of Scotland; thence to the wonderful assemblages of rigid pillars of Staffa and the Giant's Causeway, with all their suggestiveness to rock-builders, the transition is shorter still; while, in many parts of the three countries, we have examples of trap weathering into a mass of many coated spheres of every size, decomposing layer by layer, with only a small core of the untouched rock in the centre of each ball. It is a noteworthy fact that basalt in this spheroidal condition weathers and decomposes much more rapidly than it does in the prismatic or columnar state. Rocks such as these, we have been considering (with the exception of the grits) have also been thrown up in a molten or pasty condition, which precluded their being subject to many of the rules which water-deposited rocks are bound by. Their structure is a great measure the result of cooling; and, although the

frequently have a bedded appearance, they are not under the rigid sway of dip and strike which in all other rocks is all-powerful in producing, or rather in preparing, the structure of a country. Indeed, in the great majority of cases, it is the advent of the eruptive rocks which has given to the sedimentary deposits their present positions, or what is technically called the "lie." Few of the latter, whether sandstones, limestones, shales, clays, or sands, are now lying in the horizontal position in which they were formed, especially in much-disturbed and dislocated Britain. Great geological operations have taken place since then, and have squeezed, tilted up, and broken these beds of rock into every shape. And it will be obvious to all that, had it not been for these great changes, the edges of these rocks could never have been brought under the influence of rivers to carve them on a large scale into hill and dale, and of rain more delicately to "weather" and ornament them. It is, therefore, very necessary to observe the dips, or general mode of lying of the beds, of any district which it is desired to make use of for rock-work purposes. The writer has seen a large rock-garden in the north of England which was laid out with great care and at vast expense, and which is spoilt by one apparently small, but fatal oversight—the dip of the beautifully-arranged rockery-blocks is westerly and strongly marked, while the dip of the real "live" rock immediately beneath is due east. Now this seems a small thing to find fault with; and it is true than an uneducated eye might be well pleased, in ignorance of the defect. But consider that to the easterly dip in that part of the country is to be attributed the shape of the hills and valleys which make its beauty; without it the fine slope on which this garden stands would not be in existence—the entire district would be altered, to say nothing of the fact that, were it not for this dip, and the vast industries which it fosters, the wealth which built the rock-garden would have been elsewhere. "Follow Nature in all things," is the only safe motto for the landscape gardener. It would be tedious, and perhaps not very useful to enumerate the different kinds of water-bedded rock which can in Britain be used for rock-work. A glance at the chief members will suffice.

Of the grits we have already spoken, and their mode of weathering is that of the entire class of sandstones, coarse and fine grained, massive and flaggy. With regard to the latter, it may be allowable to point out, for special reprobation, a mode of rock-building which seems to be gaining favour in many districts. It consists in placing a number of broken flagstones on end, and in every position relatively to one another; the result is peculiarly hideous, and resembles no possible combination of Nature's art, since the flags, at whatever angle they may be dipping, are always parallel among themselves, except in the case of the arrangement known as "false bedding," which is one not likely to be successfully imitated. Sandstones are, as a rule, peculiarly adapted for rock-work from the forms assumed by them on weathering, from their great frequency, and from the great variety of their colours. From dark brown to bright red, from red to yellow, from yellow to white, thence through every tint of grey to blue and purple, the choice of colouring is great indeed in these rocks. They are found everywhere—as hard grits in the old silurian and Cambrian districts, as great rugged crags throughout the carboniferous regions, forming the well-known old red and new red sandstones, more sparsely distributed among the oolites, but forming occasional bands of striking character among the sands and clays of the Wealdon (witness the "greys" of the Lover's Seat and other marked natural rockeries in the neighbourhood of Hastings and Tunbridge Wells), and, in the much more recent tertiaries, appearing occasionally, as in the sands of Brussels, as lines of grotesque fistulous masses running through incumbent sand, very much as flints lie in our upper chalk.

Many sandstones and grits pass gradually into more or less coarse conglomerates, that is to say, rocks formed of rolled pebbles and blocks of stones derived from other pre-existing formations. Of such conglomerations there are many examples in Britain, and they are often very suitable for rock-work, owing to the uneven weathered surface, which is the result of the different sizes of the pebbles, and occasionally of their different hardness, which causes them to be dislodged

unequally. The permian conglomerates, in many places of central England, are great additions to the natural beauty of the scenery, and have been frequently taken advantage of for the ornamentation of grounds. Under the name of limestone must be included a very large number of rocks different in texture, hardness, and general aspect, but having this in common—that they are chiefly composed of carbonate of lime. The result of this composition is that more than any other rocks are they liable to the solvent, as distinguished from the disintegrating action of water charged, as rain-water always is to some extent, with carbonic acid. This action we see displayed on a large scale in the great stalactite-lined caverns in the carboniferous limestone of the north of England, or in the sand-pipes running deep into the chalk of the south country. On a smaller scale, the effects of this dissolving power are marked on every exposed face of limestone of every age, and help to make them everywhere worthy of the attention of the rock-gardener. In some instances thin beds of hard limestone are weathered into a curious honey-combed state, the exposed parts being of a lighter colour than the inner stone; in others the face of the beds present the appearance of a clumsy balustrade of the Louis XIV. style, the interstices having been gradually eaten away by the water running down the original lines of upright joints. Sometimes the most peculiar forms are assumed in this manner by limestones, and each kind has its own special characteristic shape, to be known only by constant observation; but perhaps no rock equals the great magnesian limestone of Durham in the eccentricity or in the multiplicity of its disguises. This limestone is of a yellowish colour, and its structure is wonderfully diversified, sometimes hard and compact, sometimes friable, often concretionary and botryoidal, occurring as a mass of radiated concentric spheres of all sizes, generally crystalline, often as a distinct breccia or agglomeration of angular fragments held together by a cement of similar material. A walk along the coast of Durham, from South Shields to Roker, will show to what vagaries of weathering and denudation this extraordinary variety of conformation has given rise. The high cliffs are in places worn into deep caves; in others slender pillars of rough rock have been separated from the main mass, and stand solitary on the beach, while larger islands of rock stand out at sea, through which arches of every size and shape have been excavated. No rock can be better suited for rock-work if used judiciously, and it is moreover known that its chemical composition is such as to be very beneficial to rock-plants. These magnesian limestones are called Dolomites, and it is notable that their fantastic shapes are by no means confined to England, since no mountain-range is so remarkable for abruptness and startling variety of configuration as that in the Italian Tyrol, known as the Great Dolomites. Besides the hard old stony limestones, of which we have spoken, there are in England a number of other kinds, from the oolitic stones to the chalk, which can occasionally serve the landscape-gardener's purpose. Their appearance is too well known to need description here. In newer geological series there are frequently beds of a light porous limestone, very similar in appearance to the sinter, which is deposited by petrifying springs. In many places this is called "ragstone," and it is extremely well adapted for our purpose; this distribution is, however, very local in Britain; so that, according to our theory as to the æsthetics of rockery, they cannot be very widely used. Abroad, in tertiary districts, they are far more common, especially on the shores of the Mediterranean, both on the European and on the African side. Schists and shales may, for the purposes of rock-building, be considered together; the former being simply the hardened and altered form of the latter. Their weathered appearance, where exposed, varies very much with the angle of their dip and with the degree of crystallisation to which they have attained. Some schists are quite as crystalline as granite, and they then weather in the same manner, with this proviso, that the lines of foliation, or lamination, direct the operation. Where such beds are highly inclined, as on the south-west coast, or in Brittany, a curious appearance is often seen, which may be called the "Artichoke form," as it exactly resembles the mode of arrangement of the Artichoke leaves. At lower inclinations, schists and the harder shales do not form striking features; but, by

offering slight rocky elevations, above a more or less level ground, with distinct "craig and tail shapes" they can be made highly effective in rock-gardening where they occur naturally. This has been done with the greatest success in the Central Park, New York. The softer shales may be dismissed as rockery materials, except for the purpose of forming the lower of the two beds of rock necessary for the construction of a good waterfall or of an overhanging crag. While on the subject of waterfalls, it may be as well to remind the landscape-gardener that, with very few exceptions, the rocks forming waterfalls in Nature dip up-stream, and this holds good for great and small falls alike. The clays and sands need not detain us; where these "unrocky" materials prevail, the rock-maker is clearly entitled to do the best he can to try and imitate the rock-masses of more favoured districts. But even then he should be bound by what we will call our third rule, which flows naturally from the other two laid down above. In no case should your rockery be constructed in a manner contrary to the broad geological laws to which all rocks are subject in their natural state.

In this brief survey of a large and interesting subject, it has only been intended to suggest some points for the consideration of rock-builders, and to show that success in their art, as in every other, is to be attained only by strict and careful observation and study of Nature's own models. G. A. L.

SUNKEN BOILERS.

WHEN it is found that a stokehole that is 5 feet deep has 4 feet of water in it, which can only be kept under by constant pumping or bailing, one is naturally tempted to ask whether sunken stokeholes are absolutely necessary. As long as the weather remains very sharp and dry, the springs will be at a low ebb; but when, as has been the case during the past month, we have an immense and continuous rainfall, it changes the aspect of affairs; for, wherever water can force itself in, it will do so, to the partial extinction of fires and the discomfort of stokers. We are here on the margin of the Thames valley, and in a country that is flat and with a very sluggish fall; when, therefore, the water, as is the case now, is found within 18 inches of the surface, it is evident that something more than ordinary precautions are needed to keep it within bounds. My stokehole, when first constructed, was protected all round with a considerable thickness of clay-plugging, but it has never proved efficient; and now, for the second time in four years, I have been subjected to this annoyance, although, thanks to the comparative absence of frost, and my growing-stuff being chiefly half-hardy, no damage has yet been done. If, however, it was necessary to force, or to maintain a moderate heat, it would, under present circumstances, be almost impossible. Of course I shall be told that the stokehole ought to be properly drained. This is quite true; but, if this can only be done at great cost, it is evident that it is easier to give the advice than to put it in practice, and I therefore wish to know whether our hot-water engineers cannot devise some means which will enable us to dispense with these stokeholes altogether? Cannot boilers be constructed more horizontal in shape, rather than perpendicular, and the piping be fixed higher in the houses than is now commonly the case? It is, I believe, a fact that a 3-inch pipe, fixed near the sides of a house, is more powerful in its effects than a 4-inch pipe placed on the ground line, and, by having the heat near the wood-work and glass, both would be kept drier and more enduring. The cold air that penetrated through interstices in the building would thus be more quickly warmed than is now the case. There has been a mania of late for large boilers, or those of novel shape, but little has been done in the way of improving their construction, especially as regards setting, when required for a small quantity of glass. Now-a-days the cost of a large boiler, which is heavy in itself, is almost doubled by the cost of fixing it. Nothing less than an enormous well appears to answer for this purpose. Thus, where a large extent of glass is used, a leakage in the boiler may in a moment produce a complete collapse of the entire heating power. Mr. Fish (page 58) makes some remarks on this subject, and I am pleased to see that he discountenances the practice of setting boilers under their work; but I fear that in the case of very large boilers it is almost a positive necessity. It would be a matter of great interest to all who have glass houses under their charge if the question were taken up and decided once and for all. If it could be proved satisfactorily that a sunken boiler is unnecessary, the discovery would be hailed with some satisfaction, and would almost revolutionise our present heating arrangements. A. DEAN.

Bedfont.

THE HERBACEOUS ROSE MALLOW.

IN most of the brackish marshes in the Eastern States a beautiful species of the Rose Mallow grows quite abundantly. Its botanical name is *Hibiscus moscheutos*, and it belongs to the great Mallow family of plants, which includes the Cotton okra or gumbo, Hollyhock, Rose of Sharon, and many other well known, useful and ornamental, herbaceous and shrubby plants. Of the Rose Mallow there are also quite a number of distinct species found growing wild in various parts of America. They are rather coarse-growing herbaceous plants, with stems varying from $\frac{1}{2}$ inch to 1 inch or more in diameter, and from 2 to 8 feet high. The most common species in the Atlantic States is the one named above. Its flowers are very large, being from 4 to 6 inches broad, varying in colour from a pure white to a deep rose, some having a dark centre, others being without it. The salt marshes in the vicinity of New York, as well as elsewhere along the coast, are dotted with clumps of these plants, which bloom through the early autumn. According to the correspondent of the "Daily Rural Life," who writes so charmingly in "Moore's Rural New Yorker," these Mallows make the extensive salt meadows, as they are termed, quite attractive flower gardens. In fact, there are few more showy or beautiful plants at this season, and it is often wondered why it is not more frequently seen in cultivation. The wild or cultivated plants produce seed in abundance, and they grow as readily as the most careless gardener could desire. When raised from seed, the plants "sport" very widely, and many shades of colour are frequently produced from those taken from a single pod. Many hundreds have been raised with the hope of obtaining a double variety, but without success; yet, as we have double Hollyhocks and double Rose of Sharon, there would appear to be no natural obstacle in the way of obtaining a double Rose Mallow. We write this with the hope of prompting others to take a hand in experimenting with seedlings of this showy and in every way desirable American plant. It will thrive in high dry ground as well as in the low and wet.

Xerophyllum asphodeloides.—I saw this rare and beautiful hardy plant, which grows in Grass-like tufts, flowering freely in the York Nurseries last summer. Its leaves are from 4 to 20 inches in length, and not more than the eighth of an inch in width; their upper surface is flat, the under sides convex and furrowed, and the edges are furnished with minute teeth, resembling those of a miniature saw. The longer leaves are gracefully recurved, while the shorter ones, which are in the centre, are more or less erect, forming altogether a graceful circular plume. The flowers, which are white, are produced in an erect spike from 12 to 18 inches high; and, although the individual flowers are not large, yet, owing to the abundant way in which they are produced, the general effect is most beautiful, the erect stem contrasting, in a striking manner, with the tufts of graceful recurving leaves at its base. When this plant comes to be better known, it will doubtless be extensively used for table and other decorative purposes, for which it is admirably adapted, as the leaves are of such a texture as to withstand the effects of dry air and gas. This I have proved, having had a plant of it in a room during the past three weeks. The pot in which it grows is placed on the stand of a moderator lamp, the base of which is surrounded with Ivy-leaves, interspersed with a few flowers; while the longer leaves of the *Xerophyllum* gracefully recurve and fall over and conceal the upper portion of the stand, thus forming a very ornamental and pleasing object, and one which has been greatly admired. Although this plant will grow and thrive tolerably well in ordinary garden soil, yet it succeeds best when planted in a compost consisting of equal parts of peat, loam, and white sand. It forms a handsome object planted on rock-work. It is a common plant in the Pine barrens of North America, from New Jersey and Oregon southward.—R. P.

Alonsoa linifolia (Roezl.).—This *Alonsoa* is said to grow from 1 to 1½ feet in height, and to be bushy and compact. The centre branch, as well as the surrounding ones, are so displayed as to form a symmetrical and graceful specimen, the component parts of which are covered from almost the base to the summit with innumerable glowing light scarlet blossoms. This species surpasses in every respect the few sorts of the genus *Alonsoa* at present known. An uncommonly free-flowering nature and dwarf graceful habit, combined with an exceedingly pretty dark green Flax-like foliage, agreeably contrasting with gay-coloured flowers, are characteristics possessed by this novelty, which cannot fail to procure for it rapid and universal cultivation. It is easily grown, and is susceptible of both pot and open ground culture. Employed either for large or small masses, or as isolated specimens, the *Alonsoa linifolia*, bearing as it does a striking resemblance to certain of the elegant foliaged New Holland plants, will produce a surprisingly beautiful effect. Sown in March, this annual will flower early in July.—W. THOMPSON.

NOTES OF THE WEEK.

— WE have just seen a beautiful photographic representation of a specimen Orchid, *Angræcum sesquipedale*, which has recently borne twenty-three fine flowers in Mr. Wilkin's collection at Leyton. It represents, we believe, the finest specimen of this singular species hitherto produced in this country.

— MR. ROBERT BROADWATER, Master of the Fruiterers' Company, will, we are informed, preside at the thirty-second anniversary festival of the Gardeners' Royal Benevolent Institution, to be held at the London Tavern on the 2nd of July next.

— MR. W. THOMSON has brought under our notice forced flowers of a kind of Bladder-nut (*Staphylea escallonioides*), which is now being used in bouquets and "button-holes" in Covent Garden. The flowers are borne in clusters, and are of a snowy whiteness with a satin-like lustre. The perfume is of a peculiar but very agreeable character. As these flowers combine the lustrous whiteness of the Tuberose with the elegance of the Jasmine, it is singular that their value for decorative purposes has been so long overlooked.

— THE "Journal de la Société d'Horticulture" has an article on indiarubber-producing plants. This paper is a collection of well-known facts relating to these valuable plants, the only point of interest being in connection with the Central American Caoutchouc tree (*Castilloa elastica*, Cerv.), which, we are told, in the district of St. John, in Nicaragua, furnishes employment to from 600 to 800 persons, in drawing off the juice. In the neighbourhood of Parma about 2,000 persons are so employed.

— IN the present crisis of the Royal Horticultural Society's affairs (writes Dr. Denny), the policy of the Fellows is to request the council to open at once communication with Her Majesty's Commissioners, with the view of transferring the gardens to them, under satisfactory arrangements for the debenture holders and the life and local Fellows, and with a *locus standi* there for shows and meetings. The Fellows, he adds, have but to be united and act with vigour and determination, and the thing is done.

— THE last number of the "Florist" contains a coloured plate of two beautiful new show Pelargoniums, raised by Mr. Foster. One of them, named Constance, is a fine round rosy flower, suffused with bright vermilion, and has a dark feathered blotch on the upper segments. The other, Crown Prince, is a rich rosy-crimson flower, the upper segments of which are nearly entirely black. It is said to possess a dwarf habit, and to be a profuse bloomer. The second plate represents a new French Pear, raised by M. Morel, and named Souvenir du Congrès, a variety which closely resembles a large specimen of Williams's Bon Chrétien. It ripens in August and September, and comes in just after the last-named variety. It is grown by Mr. Dancer, at Chiswick, and also by Mr. Rivers.

— AN important discussion took place the other day, at a meeting of the Society of Agriculturists of France, on the best means of "stamping out" the Phylloxera in French Vineyards. M. Blaise disputed the legality of the acts of certain prefects, in uprooting all the Vines attacked. Baron Thenard thought otherwise, and justified the adoption of vigorous radical measures for the extirpation of the pest which threatens all the wine districts of that country. M. Victor Lefranc declared that such extreme measures were unjustifiable; there is no similarity, he contended, between the cattle-plague, which is destroyed with the animal infected, and the Phylloxera, which remains after the plant infested is destroyed. There is every hope that such an enormous waste of capital may be avoided, by the discovery of a remedy—nearly attained, though as yet unknown—operating through the extinction of the plague, rather than by the entire destruction of the affected Vines. The meeting passed a resolution, deprecating the compulsory uprooting of Vines.

— MR. NORMAN, St. Catharine's, Ontario, writing to the "Times" concerning the Colorado beetle, commends the Prussian Government for having prohibited the importation of Potatoes into Germany. He states that a few years ago this beetle was unknown in Eastern America, but that now it is spread over the whole of Canada to the Eastern States, producing quite as disastrous a blight to the Potato fields as the fungoid diseases so well known in Europe. Last summer he saw whole fields of Potatoes in perfect health and vigour one week, and a fortnight afterwards every portion of the foliage was eaten away to the bare stems. This, occurring before the tubers were mature, arrested their growth and ruined the crop. He adds that the only way to prevent the introduction of this pest into Britain is to follow the example set by Germany, and to include Tomatoes, which are also liable to the attacks of this beetle. The most likely way of the insect being brought to us, he thinks, would be among the Potato haulm, used in packing the tubers, for the beetle does not burrow into the Potato, but eats only the leaves and stems.

In shape, this destructive pest is not unlike a large lady bird (*Coccinella*); but, instead of being spotted, it is striped.

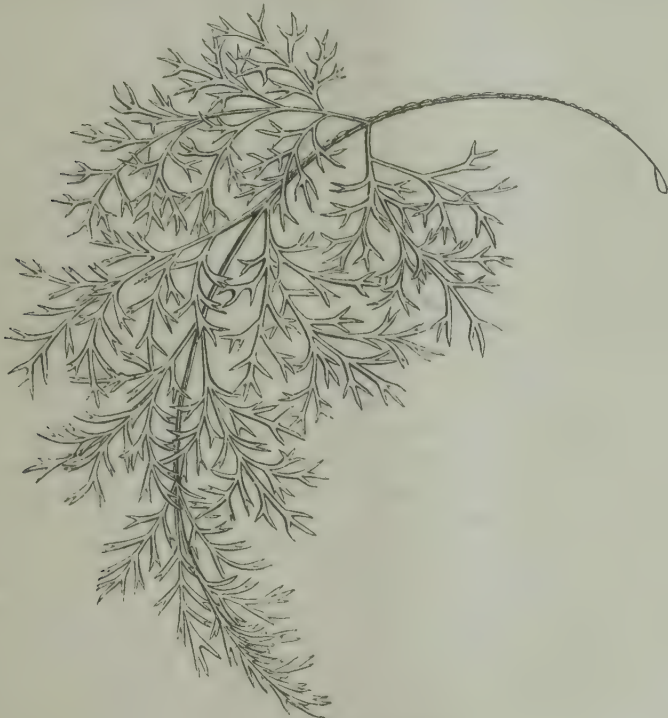
— MR. HERBERT asked the Chief Secretary for Ireland, the other evening, whether Her Majesty's Government had taken any steps to prevent the introduction of the Colorado beetle into Ireland by the importation of American seed Potatoes or otherwise; and, should no precautions have already been instituted, what were the intentions of Her Majesty's Government on this subject.—Sir M. H. Beach said the subject of the hon. member's question was brought under his notice some time back, and he thought it right first to ascertain what steps had been taken by foreign Governments in the matter. He found that the only Governments which have taken any real action are those of Austria and Belgium. The former has assured the Government of Switzerland, which had warned the European maritime countries of the possible danger, that the importation of American Potatoes would be prohibited; and the Belgian Government has introduced a bill for a similar purpose, which has been agreed to by a special committee. He had also made inquiries as to the nature and extent of the evil to be apprehended. He thought there is reason to suppose that the harm recently done to the American Potato crop has been much exaggerated, and is informed that the insect in question has been known in America for more than a century. It attacks the stalks and leaves of the Potato plant, not the root, though that naturally becomes diseased in consequence. No Potato stalks or leaves are imported from America, and, as only healthy roots would be imported, it would seem hardly possible that the insect could be thus conveyed into this country. He is now in communication with the English Privy Council on the subject, because it is obvious that if any preventive measures are adopted they ought to apply to the whole of Great Britain as well as to Ireland. But he must add that the importation of Potatoes into the United Kingdom, especially in the event of a failure of the home crop, is very large, and that, therefore, any interference with this trade would require careful consideration.

— MR. M'LACHLAN, treasurer to the Entomological Society, writes as follows in reference to this matter:—"As an entomologist it is with feelings of regret that I read the reply (as reported in the "Times") of the Chief Secretary for Ireland to Mr. Herbert's question as to whether the Government had taken any measures to prevent the introduction into Ireland of the Colorado Potato beetle. Without being an alarmist, I consider that the right hon. baronet's reply is calculated to produce an unwarrantable feeling of security. It is stated that the insect had been known in America for more than a hundred years. Very possibly it has existed there from time immemorial, and it is probable that its real home is Central America, where it fed upon wild members of the same order of plants (*Solanaceæ*) as that to which the Potato belongs. But less than fifteen years ago it commenced a northern and eastward progress, finding, unhappily, in the cultivated Potato an abundance of food suited to it; and it has now entered the Dominion of Canada, showing a power of rapidly acclimatising itself as astonishing as it is destructive. In the reply to Mr. Herbert stress is given to the fact that the insect attacks the stalk and not the roots. The actual position is, that the eggs are laid upon the leaves or stem of the Potato plant; the larvæ devour these, thus preventing the formation of tubers or killing the plant altogether. The larvæ, when fully grown, descend into the earth to undergo their transformation into beetles, and there appear to be several broods during the year, the beetles produced from the latest hibernating in the earth and becoming the parents of the spring brood. A large importation of Potatoes from America into this country has, I believe, existed for some time. That the most destructive larval stage of the insect should accompany these importations is improbable. The real danger consists in the possibility of the pupæ or perfect beetles being conveyed with the tubers, especially in cases where the earth has not been thoroughly removed, and it is by no means an impossibility that the beetles might also be imported, still living, in portions of haulm, especially if this be used for packing, as is often done by our own Potato-growers. That the amount of its ravages in America may be exaggerated is possible; but that enormous damage has been done is certain, and to such an extent as to render exaggeration justifiable as a means of exciting public attention to a full knowledge of the existence of the evil. I have, I think, shown how it is possible for the pest to be introduced into Europe, and it will be wise and prudent that caution be exercised. That some of the most destructive insect-pests (the Phylloxera, for instance) have been introduced from America there is every reason to believe; and, on the other hand, the evil has in some instances been reciprocated. Our common small white butterfly, so destructive here to Cabbages and all Coleworts, was unknown in America until five or six years ago, but each year shows its greater extension and destructiveness."

THE GARDEN IN THE HOUSE.

FOLIAGE FOR HEAD-DRESSES.

It is well-known by ladies who use floral decorations in their hair at evening parties, that the flowers stand the heat of the head, and the rough usage of a light shawl thrown over them, far better than the leaves do. One lady of my acquaintance is very careful to harden off her plants of Maiden-hair before cutting the fronds; another lady always soaks her cut fronds in cold water for at least twelve hours before using them; a third presses and partially dries her Maiden-hair for two or three days before the fronds are wanted; a fourth is particular in only using those fronds which have brown seed-vessels on the under side, and in keeping them in slender glass tubes full of water, which are concealed under the plaits of the hair. To these, and to others interested in the matter, I commend the leaves of that beautiful greenhouse evergreen shrub, *Lomatia propinqua*, as the most durable kind of delicate foliage with which I am acquainted. The accompanying illustration shows a leaf which had been worn for two evenings before it was sketched. The only preparation which it requires is to twist a piece of wire round its stem, making a loop at the end that it may be secured with a hair-pin. A few pips of common scarlet Geranium or Hyacinth, properly wired, and arranged judiciously amongst the leaflets, form a simple and pretty head.

Leaf of *Lomatia propinqua*.

dress, which is quickly made up and easily fixed in the hair. Many other flowers might be similarly used, if care be taken to choose a leaf of a size proportionate to that of the flowers which are to go with it.

W. T. P.

DO VARIETIES WEAR OUT?

THE old Greendale Oak tree here is, perhaps, one of the oldest trees in Britain, and the only thing known concerning its history is, that it was an aged tree at the time of the Conquest. At the present time it girths nearly 50 feet in circumference above the carriage road cut through its immense bole, or about 11 feet from the ground. On one side of its giant trunk the timber and bark have long since been dead, and this side has to be supported by means of strong pieces of timber fixed in the ground, and placed underneath the strongest branches. On the other side the tree is still alive, the main branches being about 60 feet in height, and, in favourable seasons, Acorns are still produced on them. These Acorns are not so large as on younger Oaks, but grow quite as well, and the young trees raised from them are quite as healthy as any in the young plantations here. The plantations in which the trees have been raised from this patriarchal Oak are all marked with iron plates, and the date of the year in which they were planted is stamped on them. For the last thirty years I have been in the habit of picking up a few Acorns of this tree, and raising young Oaks from them to give away to people anxious to plant them, on purpose to say that they were from seeds of the Greendale Oak. Experience leads me to agree with Mr. Fish (p. 103), "that varieties cannot be said to die out from sheer lack of vital force, weakness, or old age."

W. TILLERY, Welbeck.

THE FRUIT GARDEN.

THE GRAPE VINE.

(Concluded from page 86.)

Stocks for Weak-growing Varieties.

SOME of the weaker-rooting varieties of the Vine are much improved when grafted on kindred sorts of more vigorous constitution. The reciprocal of the stock and scion is not fully understood as yet; but it is sufficient for practical purposes to state here, with regard to the Vine, that the stock should be hardy, vigorous, and fruitful, and in constitution and habit similar to the scion or variety to be grafted upon it. I prefer to give this rule as a general guide rather than name, as suitable for stocks, any kinds which may not prove to be so in all situations. Vines differ in a remarkable degree in different soils and situations, but no one is likely to err in grafting on established plants that are in a healthy and fruitful condition. For instance, though the Barbarossa is considered to be one of the worst stocks, being a very late variety and an unusually shy bearer, I would not hesitate to graft upon it where it did happen to be fruitful, as I have seen it at some places. Under the care of Mr. Henderson, of Thoresby Park, it has fruited most freely, and the bunches, in symmetry and appearance, were perfect. In such circumstances, no doubt, these good qualities would have been imparted to another variety worked upon it. The Black Hamburgh, Muscat of Alexandria, Lady Downes, Raisin de Calabria, Royal Muscadine, Trebbiano, and Alicante, are all varieties that generally succeed well, or best, upon their own roots, and they are also among the best for employing as stocks. The Golden Champion—a grand Grape—succeeds best, according to Mr. Thomson, of Drumlanrig, when grafted on the Muscat of Alexandria. We had it in fine condition for several years on the Black Hamburgh; but, when the Vines came to be forced early, it entirely ceased to show fruit, while still growing vigorously, and had to be cut out, though the other limb of the Vine (the Hamburgh) continued fruitful. Mrs. Pince, with us, makes by far the finest bunches on the Alicante, the bunches being broader shouldered and more shapely. On the Lady Downes it does well, but the bunches are hardly so large, and are more cylindrical. On its own roots it is comparatively worthless, and these differences are all observable upon Vines of the same age, and growing in the same house. Buckland's Sweetwater, a good Grape, and one of the earliest of early white Grapes, but a somewhat shy fruiter, is also improved when grafted on the Black Hamburgh; so also are the Frontignans, which are generally weak rooters. Indeed, it is better always to graft than to plant weak-growing kinds, more especially when the border is already in possession of the roots of established Vines.

Diseases and Insects which Attack the Vine.

Mildew.—This is one of the worst diseases that affect the Vine. Fortunately, it does not very often attack Vines grown under glass in this country, and good culture and attention will generally ward it off; but, when it does get established upon the plants, it is most destructive in its effects. It is generally the result of unhealthy root action, a too low temperature when the Vines are in full growth (thereby predisposing them to the disease), a stagnant atmosphere, insufficient ventilation, or, in fact, anything which lowers the vitality of the Vine when it is growing. Intelligent treatment, therefore, such as we have often recommended in former chapters, is the best preventive. The disease should always be watched for, however, as preventive measures, when it does occur, are only successful when taken early. It always appears at first upon the surface of the leaves, in the form of small white dusty-looking specks, just indicating that the parasite has taken hold; but it will often appear over a whole house of Vines before its presence is noticed or even suspected, and, if not checked, it spreads over the leaves with marvellous rapidity, killing the tissue wherever it establishes itself; eventually it reaches the berries, covering them as with a white hoar, destroying their skin as it does the tissue of the leaves, and utterly spoiling the crop and seriously injuring the health of the Vines. It can only be checked, when it does appear, by timely action, and sulphur is the only remedy.

The sulphur should first be mixed with a small quantity of milk until it is thoroughly disintegrated, then poured into a pitcher of water, and applied to the Vine with a syringe until every leaf is wetted. This will seldom fail to destroy the parasite, though it may have to be applied more than once. In winter the Vines should be washed, and afterwards painted with sulphur and milk.

Shanking.—This is a disease incidental to bad culture and certain soils, and is, more or less, well known to all Grape growers. The disease attacks the foot-stalk of the berries at or after the stoning period, when the berries are changing colour. They lose their fleshiness, have a disagreeably acid taste, and soon shrivel and drop off if the bunch is shaken. In aggravated cases the whole crop is sometimes lost for several years in succession. Various causes have been assigned for the disease: such as great disparity between the temperature of the border and that of the vinery, heavy cropping, excessively high temperatures, &c. No doubt debility, arising from any cause, will help to bring on the disease; but it is a fact that it will attack in its worst form Vines that possess the greatest apparent health and vigour as regards wood and foliage, and where the highest skill is brought to bear on their culture. One of the worst cases of shanking that ever came under my notice occurred in Vineries where the borders were all inside, and were heated with hot-water pipes. The borders were made of the most approved materials and nothing was wanting, it was thought, to ensure success. The Vines grew vigorously, and were not cropped till the third year, and then only moderately; the bunches were large and promising, but nearly every berry shanked up to the foot-stalk of the bunches; and this went on more or less for years, till the Vines were pulled up. I ought to state, however, that shanking had always been unusually troublesome in the place, attacking both young and old Vines, pot Vines, and Vines growing in outside and inside borders; and it went on under the superintendence of different gardeners, who, before and afterwards, produced excellent Grapes in other parts of the country. We are forced to the conclusion, therefore, that the disease must have been due to something in the soil, or to its deficiency in some quality or other which was needful to the well-being of the Grape. The staple of all the borders was turf from pastures, of a light texture, and from a gravelly sub-soil, and lime scraps were added to it. It would, seem, therefore, that shanking may arise from circumstances over which one may have no control, so far as our present knowledge of the disease extends; but I have invariably observed that it was least troublesome in heavy soils. In our very heavy soil here, shanking is quite unknown; nor, though good and indifferent Grape-growing may be seen in the district upon the same formation, I have never seen any serious cases of shanking. Under these circumstances, I feel I cannot offer any specific advice on the matter, further than is contained in my former remarks on the subject of soil, border-making, watering, airing, temperature, &c., which, if carried out, will go far towards preventing the disease.

Red Spider and Thrips.—The first-named of these two plagues is most to be feared, though thrips, individually, are by far the most destructive; but, as they do not breed so fast, they do less damage. Red spider is always most destructive in Vineries where much artificial heat is used, and, for that reason, experienced Grape growers dispense with fire heat whenever opportunity offers, especially at night. I can give no better advice than this, unless it is to say, "give your Vines abundance of water at the root, and contrive, by moderate temperature and otherwise, to secure a stout and healthy condition of the foliage, for red spider always finds out the weakest subjects and the weakest varieties." Syringing as often as possible will help to keep the Vines free, and it is well worth while to wash the leaves with a sponge and soft water whenever they are observed to be affected. The same preventive measures should be taken with thrips, and they may also be smoked successfully with tobacco paper; but not after the Grapes are ripe, as the tobacco strongly affects the taste of the Grapes.

Rust.—Rusty Grapes are the result of contact with some other object, such as the hands or the head, or sudden draughts of cold air against the berries when they are just

set, and, above all, of very hot pipes at that time. I am perfectly convinced that excessively hot pipes will produce rust on any variety of Grapes sooner than anything else. Of many well-proved cases of this, I will give one which happened here. Some years ago the man in charge of the Vineries inadvertently let the pipes get too hot in a Muscat and Hamburgh house, when the berries had just set; the pipes were so hot as to smell strongly, and blister the hand when held upon them. They were not so long, however, for, anticipating the consequences, I had the pipes emptied as soon as discovered, but not soon enough to save the Grapes. The rust was visible a day or two after, being worst round the ends of the houses, and along the front—in fact, everywhere near the pipes, and gradually getting less and less further up the roof. The Hamburghs were the worst affected, but some of the Muscats were bad enough. Lady Downes and Black Alicante seem less susceptible than most other varieties; but they, too, take it occasionally. I have frequently had a few bunches rusted in one particular corner of our late Vinery, where they hang rather near the pipes. My advice, therefore, is, "avoid all these causes, and rather do with low temperatures in cold weather than too hot pipes."

Warty Leaves.—It has often been asserted, in horticultural journals, that the warty excrescences which appear on the under side of the Vine-leaf, under certain circumstances, do no harm to the Vine; but this is a great mistake. The warts are the constant result of a close damp atmosphere and insufficient ventilation; they never appear under any other conditions. The warts first appear thinly scattered over the leaf; they get thicker and thicker until they coalesce; the leaves become cupped and crimped; the growth of the plant is completely arrested, and no curative measures will restore it to health again after it gets to this stage, though sulphur on the pipes will kill the warts. The only preventives are a dry atmosphere and plenty of air. It is a disease that should never occur to any serious extent under ordinarily good culture.

Scorching of the Berries.—This scorching, which takes place when the berries are about half-swelled, is almost confined to the Lady Downes Grape, and is sometimes very destructive, but scarcely ever so under good management. The damaged berries appear black and discoloured on one side, the tissues being simply killed, as if the berries had been dipped in boiling water. When it appears, the temperature should be lowered a little, and more air and a drier atmosphere given. This generally prevents further destruction. Vines that are not forced too hard, but brought on gradually with a free and constant circulation of air in the house, are seldom affected.

J. S.

SMALL HOUSES BEST FOR MELONS.

WE grow our Melons here in comparatively small houses, and owing partly to that, and partly to a careful system of cultivation, we have few failures. As a rule we sow the seed in January; and, as soon as the plants are large enough to handle, they are potted off singly in 60-sized pots and are placed in a Cucumber-house. As soon as they have acquired sufficient size they are planted upon a ridge run along the centre of the bed in which they are to grow. The soil for early work is not compressed so firmly as that for late Melons, because we find that the plants grow faster in light soil than in hard material. As soon as the roots show themselves on the outside of the ridge more soil is added, until the beds are 2 feet 6 inches wide and 10 inches deep; the soil consists of three parts loam enriched with one part cow-dung or Mushroom-bed manure. From the time when the plants are started into growth until they begin to ripen their fruit they are never allowed to become dry, and the water applied is always of the same temperature as that of the house; if anything, warmer. I also water frequently with manure-water, such as drainings of stables, &c., largely diluted. Thus encouraged, the plants grow vigorously, and soon reach the wires, on which they are trained like Cucumbers; and, as soon as the fruit is set, say two or three on each plant, the shoots are pinched back to one or two joints beyond the fruit, and all superfluous growths are removed. Melons should be looked over daily; it is bad

practice to leave them for a week or so and then cut away a barrowful at one time. If bleeding occurs, dust the wounds with slaked lime; and, if symptoms of canker or rot appear, the same application will often be found to stop them. I always endeavour to keep the collar of the plants from the time they are planted out until they have finished growth level with the surface of the bed. In fertilising the blooms care is required, especially if more than one kind is grown in the same house. After trying many varieties, I have come to the conclusion that Meredith's Hybrid Cashmere, Victory of Bath, Scarlet Gem, Bailey's Eclipse, and Royal Ascot are the best. I have tried Munroe's Little Heath, but it did not succeed with me. I syringe liberally in summer, as early as 7 o'clock in the morning, and at the same time give a little air, although we never open the ventilators, even at midsummer, more than 2 inches. This is done at top, or, rather, the back, as no air is given in front. In the afternoon I syringe again just as the sun is getting off the houses, which are shut up hot and well deluged with water, except during the time when the fruit is setting, and then plenty of water is thrown on the paths. During the early part of the season air must be given with caution, for, if Melons once get chilled, a considerable time elapses before they recover. As the season advances the beds in successional houses are made up to the desired height without the ridge, and they are pressed almost as hard as cement—a practice which keeps the plants strong. Bottom-heat is furnished by a flow and return hot-water pipe placed underneath the slates which form the bottom of the beds, and top-heat is also obtained by means of hot-water pipes. I am not an advocate for taking two or three crops from the same plants, for, if a crop of Melons is finished off properly, there will be little left for a second or third crop. Three or four small houses producing crops in succession will be found to be much the best. The temperature never ought to fall below 65°, indeed, I have frequently syringed and shut up when the thermometer indicated 100°, but, of course, this heat soon cools down after sunset.

D. S. GILLET.

Court Garden, Great Marlow.

BOUGHT v. HOME-GROWN VINES.

MR. MUIR's assertions and figures are alike delusive, a fact which his own statement that "the poorest fruiting pot Vine will bear at least 10 lbs. of Grapes" is sufficient to prove. I am at a loss, also, to account for another statement which he makes, viz., that "as a rule, pot Vines are grown in spare corners of structures heated for other subjects." I believe pot Vines have, as a rule, a low house or pit to themselves, or perhaps Strawberries and French Beans for companions. Every gardener is well aware that bought pot Vines seldom pay as a market crop on account of the first cost, the extra attention required, cost of fuel, and labour. If, indeed, the results are as good as Mr. Muir attempts to show by his figures, how is it that Grapes are so little cultivated by fruit-growers for market? Simply because they don't pay. They serve a useful purpose in enabling private gardeners to save their permanent Vines and cut a few early Grapes, and it is mainly on that account that they are grown. I know that there is no more harm in buying ready grown pot Vines than in the purchasing show plants immediately before an exhibition; both practices are known and permitted, but I maintain that as good Vines are grown in hundreds of private gardens as are ever sent out by the trade, and Mr. Muir has failed to show the contrary. Mr. Muir should consider that many of our most noted "trade" growers of Vines were private gardeners, and that, in some cases, the very Vines from which they are now cutting Grapes and propagating pot Vines were raised in private gardens. Let Mr. Muir name the grower who cuts 3½ lb. clusters of a nameless variety from his weakest and discarded canes.

J. CHURCHILL.

Whalley Range.

Had not Mr. Irvine and Mr. Churchill brought my name into this discussion, I should have allowed Mr. Muir's communication to pass unnoticed; but being called upon to vindicate the private grower, I do so with pleasure. How can a man be a skilful Grape grower, let me ask Mr. Muir, unless he can grow Vines in pots? I have seen Vines in pots grown by gardeners when Mr. Muir was scarcely old enough to know what a Grape was, and grown well enough to carry off silver medals at the Chiswick Gardens, where they were exhibited with the fruit attached. Should, however, any of the contributors to THE GARDEN desire it, I can furnish them with

clear proof that in many instances "home-grown pot Vines are superior to bought ones," and Mr. Muir should re-arrange the heading and contents of his article, if he wishes to free himself from the error into which he has fallen. No doubt, Mr. Muir had in his mind's eye, when writing, some particular Vinery; and we do not for one moment doubt that the Vines grown in pots there are of the best description. But Mr. Muir must recollect that one place does not represent the three kingdoms; thousands are grown yearly about London alone, and it is to pot Vine-growing generally that my remarks refer. The generality of pot Vines are grown in huge span-roof houses, plunged in a tan bed in the middle of the house, and packed thickly. They are subjected to a strong heat, both top and bottom, are kept moist, and are grown rapidly. All the Vines have stakes to keep them straight, and, when full grown, they are one mass of foliage, perfectly impenetrable to either light or air; therefore, what is to form the fruit buds? The fact is, only about half a dozen eyes at the top of each cane get ripened. I have myself bought twenty pot Vines at 12s. 6d. each, and the whole only showed sixteen bunches.

R. GILBERT.

[Here, we think, this discussion should end.—ED.]

RAISING VINES FROM EYES IN TURF.

MR. MUIR's statements (p. 108) in reference to this matter are incorrect; at least, I must consider them to be so until he vouches for both the time and the place where he saw the practice in operation before 1867 or even 1871. The practice has, at all events, become identified with my name, and was copied, as described by me years ago in the "Gardeners' Chronicle," into several horticultural journals, including some of the Continental ones, and no one then thought of disputing the priority of the practice. As to the Lady Downe's house at Dalkeith, I prefer to believe the evidence of my own eyes and that of Mr. Thomson, who, at p. 273, 1871, of the same journal, states distinctly that he did not raise the eyes from turf. But, just to show how much your correspondent knows about what he writes, I may state that the Lady Downe's Vinery at Dalkeith—of the history of which I could furnish him with every particular, from beginning to end—was not planted with young Vines from eyes at all, but, throughout, with one-year-old plants cut down. So much for the veracity of those who "assured" Mr. Muir to the contrary; and if he desires further confirmation of the truth of this, I refer him to page 31 of Mr. Thomson's book on the Vine. After the knowledge Mr. Muir has displayed of recent horticultural literature, I am quite prepared to believe that he may have both seen and practised the sod system of raising Vines, without knowing its history; and that he should, by this time, have discovered the plan to be worth recommending and practising, is what I should expect.

J. SIMPSON.

Wortley.

Distances at which Pear-trees should be planted from each other.

	ft. in.		ft. in.
Standards on Pear stock ...	16 3	Cordons, oblique, single ...	1 7
Standards on Quince stock ...	13 0	Cordons, oblique, double ...	3 3
Pyramids on Pear stock ...	13 0	Palmettes on Pear stock ...	26 0
Pyramids on Quince stock ...	9 9	Palmettes on Quince stock ...	13 0
Pyramids on Pear and Quince alternately ...	6 6	Palmettes, alternate ...	13 0
Columns ...	4 10	Palmettes in the vertical form, called Verrier, with one series ...	3 0
Cordons, horizontal, with one or two branches ...	9 9	Verrier with two series ...	4 10

and so on, increasing at the rate of 2 feet for every additional series. Standards on the Pear stock are only admissible in gardens where the soil is of inferior quality, or in the case of varieties which do not succeed on the Quince. In the open fields, where none but vigorous varieties are planted, and where the trees are very much left to themselves, the distance should be, at least, 32 feet.

J.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

What are the Best Filberts, and how Should they be Grown?—I wish to plant a considerable number of Filberts, and shall be much obliged if some of your readers can enlighten me as to the best kinds to grow, the soil on which they thrive best, the distance at which the trees should stand from each other, if they require manure, and, if so, what kind, and any other hints as to their culture.—E. A. N., *Kent*.

Tobacco Dust a Remedy for Bleeding in Vines.—After pruning our early Vinery this winter a Muscat of Alexandria commenced bleeding profusely from more than one wound, owing to its proximity to a warm drain, through which pipes are led to a range of plant-houses. We tried various remedies for stopping the bleeding, but without effect until we used Pooley's tobacco dust, which was rubbed well into the wounds, dusting them afterwards with the dry dust. The effect was almost instantaneous, the wounds being sufficiently dry in a few hours to receive a dressing of Thomson's styptic.—WM. M. BAILLIE, *The Gardens, Beaufront Castle, Hexham*.

RATS AND MICE AS GARDEN PESTS.

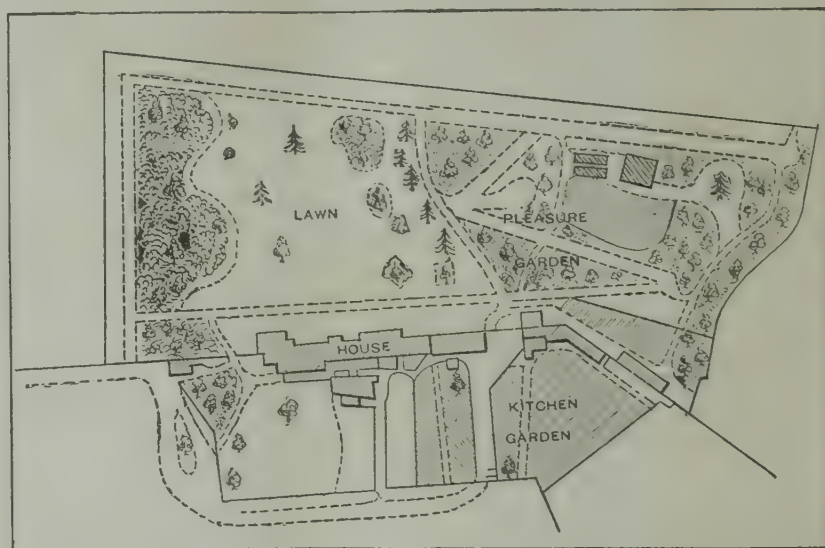
THE common small water-rat is considered a harmless little animal that usually confines his operations to the margins of ditches or small running streams; but, like all the species, he is endowed with a considerable amount of cunning, and, I fancy, he is sometimes guilty of committing depredations for which he is held blameless. I was looking in a neighbour's garden the other day when my attention was called to his Broccoli and Winter Greens; the bark was in many cases completely eaten off all round the stems, in some instances the stems were nearly eaten through, and of course most of them will die. The mischief was done by water-rats that had entered his garden from a watercourse near. I remember a somewhat similar circumstance, which for a short time puzzled me exceedingly, occurring, about fourteen years ago, in a garden I had charge of in Norfolk. Many of the Winter Greens had been barked, and in some instances the stems eaten quite through at the bottom, whilst the only indications of the presence of any enemy in the immediate neighbourhood were two or three small hills, not unlike mole hills, which, on examination, were found to be connected with an old mole run. I at first thought the mole, contrary to his usual custom, had become a vegetarian, and several traps were placed in spots most favourable for capturing him; but, in the course of a day or two, two of the small water-voles or rats were caught. They had by some means found their way into an old mole run, and had followed it up for a distance of 200 yards, until they burst through the soft earth in the kitchen garden. I was not sorry to find I had unjustly accused the mole; for, were it not for his disposition to overturn seed beds, I should look upon him rather as a friend than as an enemy. I think, for his size, there is no animal so savage and voracious as the common Norway rat; and, if allowed to become numerous, the damage they do, both to garden and farm produce, is immense. They are often very destructive to ripe fruit, are especially good judges of Grapes, and, either from their acute sense of smell or from the possession of some wonderful instinct, they always attack the best-flavoured fruit first. If choice hothouse fruit is not to be had, they will be content with Gooseberries or even Morello Cherries, but in all cases I will guarantee they will take the best within their reach of both fruit and vegetables. Many different plans have been suggested and described for their destruction, both in the way of traps and poisons; but in dealing with poisons some experience in their manipulation is necessary, in order to be successful. The best rat-killer I ever knew was a Norfolk man. His mode of proceeding was simple enough; but the materials he used, and his way of dealing with them, was a trade secret which he would not divulge. When he first looked round a place infested with rats he selected his feeding places, and fed them regularly for about a week or eight days. The food was usually barley or oatmeal, flavoured with something to make it especially attractive to the rats, and it was always used in a dry state. I have seen them running about in the evening, just before feeding time, if not quite tame, at least divested of most of that fierceness of disposition common to rat nature, waiting for his coming. When he thought he had drawn all the rats together, he laid down the poison, which, as far as appearance went, differed in no respect from the food he had given them previously, and it was a rare circumstance when he failed to get rid of all. Of course, where rats are not numerous, they may be got rid of by carefully stopping all holes in buildings with cement, trapping or snaring them in their runs, and afterwards filling up their holes in the banks or hedges where they come from with broken glass, or some material they don't like to work amongst. I have seen phosphorus used for destroying rats with a fair amount of success; it is mixed with flour and sugar in the following proportions: a quarter of an ounce of dissolved phosphorus, half a pound of sugar, and the same quantity of flour, made into a paste with water, and formed into pills. When made, the pills should be kept from light and air, to avoid loss of strength, and be placed at night in the holes or any place which the rats frequent. If not placed in the rats' holes they will be safer if laid behind a board or slate, to prevent poultry or anything else picking them up. There is no difficulty in getting poison that will kill rats; the only difficulty is to induce them to eat it. Mice, in their small way, are in some places nearly as destructive as rats; but where a good cat or two can be kept, that is the best way of keeping them down. In game-preserving districts it is nearly impossible to keep a cat, as they will wander off after the game; and in places where the natural enemies of the mice and rats, such as stoats, weasle, hawks, &c., are all destroyed, traps and poison must be resorted to almost continually. The common figure of 4 trap is the very best for setting in the open air, baiting sometimes with a soaked bean, at other times, by way of a change, with hard toasted cheese or a bit of fat meat. The very best mousetrap for buildings is Pullinger's patent; I have used no other for several years. It requires no setting, and not often baiting; it is not liable to get out of order, and, with care, will last many

years. I have often caught two mice in each and at a time; and, no matter how many are caught, if the trap be cleaned sometimes, and a little fresh grease placed in the part of the trap they first enter, they never seem to get shy or afraid of entering it. It generally happens with the majority of mousetraps that when you have caught two or three the others suspect there is something wrong, and will not go near it.

E. HOBDAY.

PLAN OF PROFESSOR OWEN'S GARDEN.

ON a former occasion we gave a view and notice of Professor Owen's quiet little garden at Sheen, and now publish a plan of the same. It will be seen at a glance how simple the plan is, and, though the place is small, how ample the breadth and capacity for views. There is picturesque variety in this garden, mainly afforded by trees, which may be seen to advantage. From the cottage across the little lawn the view by the stately Gleditschia to the Corsican Pine is very pleasing. It will be observed that there are no walks in the central part, so that, when looking from any part of the sides to the centre, the effect is not marred by these objectionable surfaces. The Grass walks are arched overhead with trees, which screen them from the central parts. The one main walk around the garden is sufficient for every purpose. Even where this passes by the house it is hidden by a wide mixed border of American plants, Lilies, &c., so that, looking from the windows, nothing is seen but

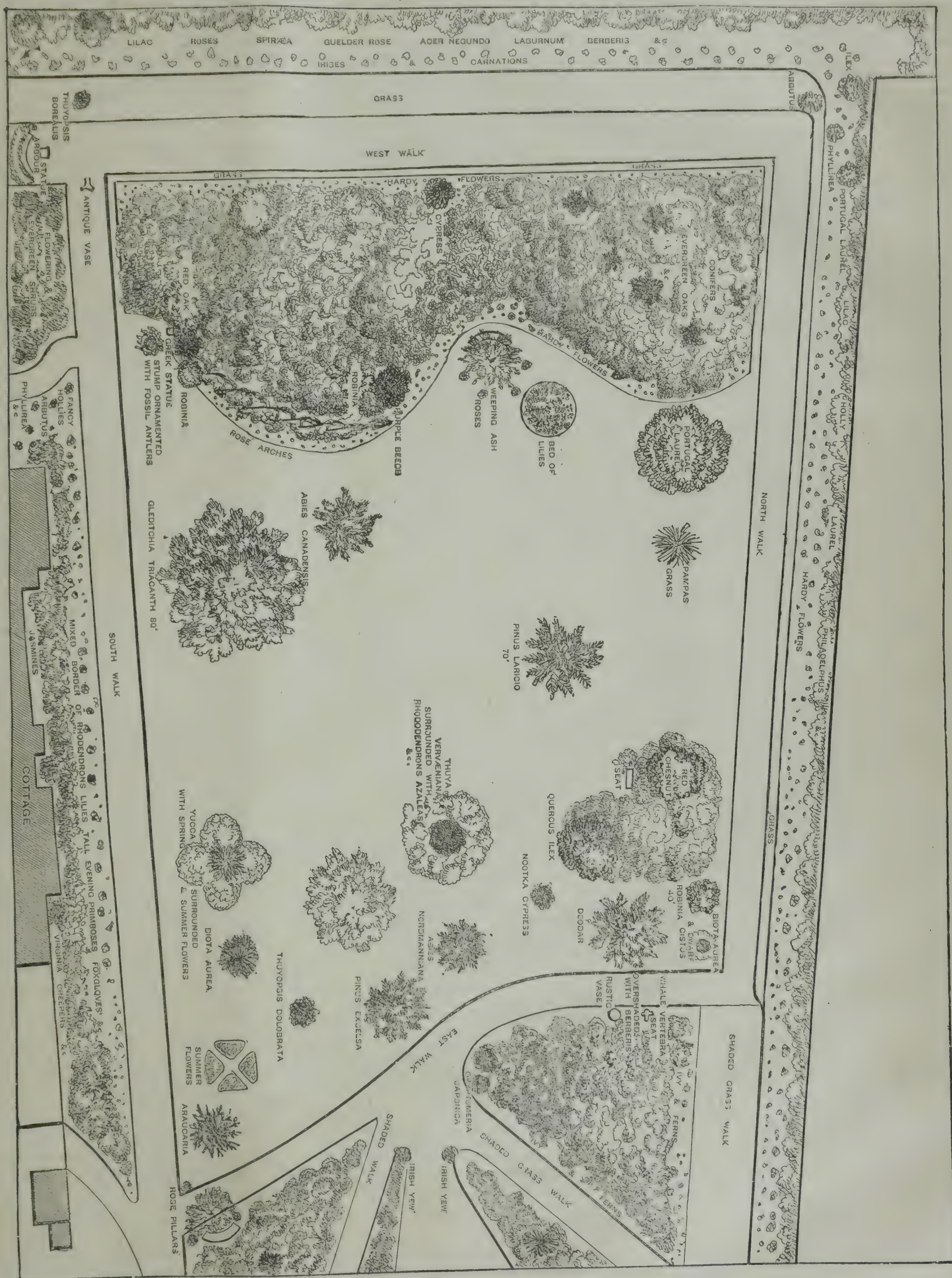


Key plan of Grounds of Cottage in Richmond Park.

trees and flowers and Grass. The Grass walks are a pleasant feature in summer. The ground on each side of them is carpeted with Irish Ivy, with a few hardy Ferns and herbaceous plants here and there. Some of the taller herbaceous Harebells looked much more charming, naturalised by these shady walks, than they ever do in mixed borders where they have to be tied up stiffly.

Conifers for Low Grounds.—"Salmoniceps" is right in supposing that *Taxodium distichum* and *Thuja occidentalis* "would find themselves at home" in low situations. *Juniperus virginiana* may be found in almost every wood and uncultivated field in this district, and it unquestionably prefers a high sandy soil. I frequently notice the young seedlings growing in the most worn out and barren lands, but rarely in moist, and never in submerged, situations. *Abies canadensis* likewise thrives in low grounds, though we frequently see it in the woods about us thriving upon hillsides. I noticed in the state of Michigan a Hemlock wood extending from the half-submerged banks of a stream up a considerable and precipitous hill to its top; there was no striking difference in vigour or symmetry. The same may be said of Hemlocks along the lowlands and hills of the Hudson River. *Taxodium distichum* is abundant in the swamps of the Southern States, where the roots produce those singular conical excrescences familiarly called "Cypress knees." *Abies excelsa* and *canadensis*, *Thuja occidentalis*, and even *Pinus austriaca* thrive in our own grounds near the banks of a lake, and not more than 2 feet above its surface water. In contiguous grounds *A. excelsa* is noticeably more luxuriant in such situations. Last spring we planted, within 8 feet of the water's edge, a specimen, each of *Pinus Strobus* and *P. nivea* (the latter, a variety of *P. Strobus*, only differing in the colour of its foliage, which is more glaucous), but they protested against such treatment, and were removed in the fall to higher ground.—E. S. C., River Edge, New Jersey.

PLAN OF PROFESSOR OWEN'S GARDEN IN RICHMOND PARK.



THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Early Radishes.—If the weather keeps mild, Radishes sown in the open ground, and covered with litter, will very soon vegetate. See that they are not kept covered in the day as soon as up, or they will be drawn and weakly. The litter should be carefully taken off in the morning, and again shaken over the bed in the evening, until the plants have got sufficient strength to bear full exposure. As soon as the first sowing is up, a second bed should be sown to give a succession, to ensure which, during the spring, great care should be taken, as this crop is generally held in very high estimation in the early season, and, without the closest attention, Radishes cannot be had crisp and uninterruptedly.

Birds and Seeds.—The seeds of Radishes, Turnips, and all the Cabbage family, are particularly subject to the attacks of birds, more particularly in small gardens. In the market gardens, where radishes are sown by the acre, a boy is regularly employed to keep off these marauders. In the small breadth required in a private garden it would not pay to employ labour in that way, yet if nothing be done, a very few finches would, in a single day, destroy a crop. For many years I have, previous to sowing, dressed all seeds of the above description with red lead, and I have never found any bird touch them—except the green finch, from which nothing will preserve the seeds but covering them with mats. The dressing, to be effectual, must be done thoroughly. The best method is to place in a large tea-saucer as much seed as it is the intention to sow, on which sprinkle a very few drops of water, for if they be made too wet, the seed and the lead will all stick together in a mass; then take a teaspoonful of dry powdered red lead, and stir the whole thoroughly until all the seed is well coated with the lead; let it stand for a couple of hours to dry before sowing—this is necessary, or the lead will wash off with the rain; whilst, if laid on with the right amount of moisture, and well dried, it will adhere to the outer covering of the seed, even when it appears above ground. With a little practice in the preparation of the various seeds that thus fall a prey to birds, the amateur will soon be able to judge when he has hit upon the right degree of moisture required before applying the lead, and upon which depends the thorough preparation. Half a pound of lead will last a season, and the trouble is nothing when compared with blank crops.

Seakale.—Put in more Seakale roots for successional supply, treating them as advised for the earliest forced. If there is at command more of this vegetable than is required for forcing, it will, if the crowns are covered with 8 inches of fine ashes or sand, blanch well when it grows naturally with the warmth of the spring. To be managed in this way, it should be planted in rows, so that the covering material can be placed over it in the shape of a continuous ridge, removable as the crop is gathered. In taking up this vegetable for forcing, the whole of the long roots, from the thickness of a finger to that of an ordinary pencil, should be forked out of the ground, and laid in soil until the time comes for planting. This is better and more certain than raising the plants from seed. If some more Rhubarb roots are now put in any building where the external air in a great measure can be excluded, it will spring fast, and come in before the outside crop, and be better in quality than that which has been forced. If a few inches of stable litter is placed over the crown of the roots outside, it will act as a protection from spring frosts, and induce them to push a fortnight earlier than such as are fully exposed.

Potatoes.—Late Potatoes, required for use from the present time through the spring, should be gone over as soon as they commence to sprout. Rub the sprouts off before they have attained any considerable length, for, if allowed to remain on, they spoil the quality of the tubers for cooking. Keep them in as cool a place as possible, so that they are not exposed to frost, but quite in the dark. Carrots, Beet, and Turnips should be gone over in like manner, rubbing the young growth off them. The sand, soil, or ashes in which they are stored should be as dry as is consistent with not absorbing the natural moisture from the roots, for, if at all wet, growth is promoted, which it is the object to discourage as much as possible.

Raspberry Beds.—Hoe over the Raspberry beds, and remove any weeds, after which give the surface a good mulching with manure. From the nature of this fruit in completely renewing its wood yearly, it takes a great deal to support it, and requires, to grow it well, a greater amount of manure than any other fruit we grow. Three inches of good solid manure, placed on the surface every year, is not too much, and the crop will well repay the extra outlay. When the plants are strong, half the breadth often devoted to this fruit will suffice, and they rarely fail in bearing if grown in suitable soil, that is, of medium strength, neither too heavy or too light. The young shoots must be thinned out in the spring to something like the number required for fruiting the following season, so that all the strength of the roots is concentrated in producing the canes

only that are required and no more. If kept clear from weeds the plants will last for a lifetime, instead of requiring re-planting, as is often the case. Guano is an excellent manure for Raspberries, applied to the surface with a little vegetable soil, or as an assistant to a light dressing of stable manure, and, when there is a deficiency of the latter in the amateur's garden, a few cwts. of good guano will be an excellent substitute; but, in the purchase of this, it is necessary to be careful, remembering that there is no such thing as a cheap article under the name. When it is offered below the current price, either wholesale or retail, the chances are that it is not worth as many pence as you are charged shillings. There is one thing to be observed respecting this manure. If, after trying a sample, it is found good, there need be no hesitation in purchasing a supply that will last for years, for, if kept in a moderately dry shed, it will be just as good, in every way, at the end of a dozen years, as on the day it was imported. I have had it much longer than this, and could not detect the slightest diminution in its strength.

Glass Structures.—Where there is the convenience of stove heat, there are many things that will shortly require attention. It is now time to start some bulbs of Gloxinia, and it is better not to excite all the stock into growth at once, for, although the plants will keep throwing up flowers more or less through the summer, still the head of bloom produced after the first and principal flowering, are much fewer in number, and, consequently, not so effective. If a portion are at once potted and placed in heat, they will soon begin to push. Do not over-pot them; an 8-inch pot will grow a large bulb, especially if it is assisted with manure-water; good sandy loam is the best material for them, with one-fifth of rotten leaf mould; place an inch of crocks in the bottom of the pots, and do not quite cover the bulb, but allow its surface just to appear above the soil; pot moderately firm, and place in heat at once. Some Achimenes should be started at the same time; these are better placed thickly in shallow pans, covering the bulbs with half an inch of soil, when they have pushed shoots an inch or two long they can be transferred to the pots or baskets in which they are to be grown. They are fine decorative plants grown this way, either for a large or small house; use baskets proportionate in size to the house they are intended to grow in. Where such plants as Allamandas, Clerodendrons, and the most useful Bougainvillæa glabra are grown, they should be at once started; the fact of their being comparatively large-growing plants when encouraged to attain their full size frequently deters amateurs from attempting their growth; but they can be induced to flower freely without being allowed to get to a size that would be inconvenient, even in a small house, by simply propagating a few every spring, which, from the ease with which they are increased and afterwards grown on, is a work of very little labour. If, as usual with these plants, they have through the winter been kept quite dry, the soil will require a thorough soaking to bring it into an healthy state for the roots to push freely. This is best effected by plunging the balls of the plants in a bucket of tepid water for a few hours. If they are such as were struck from cuttings last year, and are in 8 or 10-inch pots, they may be at once moved into others, 3 or 4 inches larger, in which to flower. In the case of the Allamandas and Bougainvillæas, remove a little of the surface soil, and re-pot in good rich fibrous loam, with enough sand added to keep it porous, as these plants require much water. In potting, ram the soil quite firm. With Clerodendrons, either of the twining or shrubby kinds, do not disturb their roots by removing much of the soil, or it will interfere with their flowering. They require similar soil to the first-mentioned plants. A few of the best Ixoras should also be grown, such as *I. coccinea*, *I. amboynensis*, and *I. aurantiaca*. These will flower in all stages of their growth, from a 6-inch pot up to a full-grown specimen, 6 feet in diameter. They are likewise so readily propagated as to make it an easy matter to have them whatever size is best suited to the situation they are required for. These plants grow the best in good fibrous peat, with one-sixth of sand added, and require a similar atmosphere, temperature, and admission, of air as Cucumbers, *i.e.*, from 66° to 70° at night. The admission of large quantities of cold external air, and a dry condition of the atmosphere is fatal to the well-being of these, the finest of stove plants, as also to many others that are equally deserving of cultivation. Anything in the shape of bedding plants that can be increased by cuttings, and are required, should now be pushed on. The tops of most varieties of Pelargoniums used for this purpose, if taken off now with a good portion of firm wood, will strike in a little heat, with few failures; and if the shoots are strong and taken off a good length, they will yet make stout plants before the time comes for planting them out. Autumn-struck cuttings, that are in store pots, should be potted singly in 48-sized pots in rich soil, and encouraged by keeping them for a time in a temperature of 48° in the night. A dozen strong plants, so managed, will be more satisfactory when bedded out than double the number that are weak and puny.

THE KITCHEN GARDEN.

RAISING CELERY UNDER GLASS.

Good Celery is always welcome, and those who desire early crops must lose no time in sowing and otherwise preparing for them. It is well known that Celery, in its wild state, is chiefly found growing in marshy places, and, when in its greatest vigour, near the sea-coast, thus showing that salt, in some shape, is beneficial to its growth. Having selected a good kind of seed, take a shallow seed-pan, put an inch of crocks at the bottom, and over that 2 inches of good open loam, with one-third of rotten leaf mould; press it down until it is fairly solid, sow the seed, and lightly cover it; plunge it in a good hotbed from 80° to 85° bottom-heat, or in an early Vinery or stove—close to the glass; if in either of the latter, material for a hotbed must be got together. Fresh manure from the stable, or mixed with leaves, should be used and thrown into a heap. In the course of a week, turn it over, and mix it well together, and repeat the operation at the end of another week; this allows all the rank heat to escape, and sweetens the mass. While this is working, the seed, which is slow in germinating, will want attention. As soon as the seed-leaves are fully expanded, pull out all the weakest, leaving a space of about an inch between those remaining. This prevents a weakly growth; then replace them close to the glass, and, so soon as they get into rough leaf, place an inch of drainage on the bottom of a box about 2½ inches deep, and fill it up with a rich open compost, making it as solid as a Mushroom-brick, and leaving it an inch deep when finished; then plant in the seedlings, about 2½ inches apart every way; replace them in the same place, close to the glass, if this be convenient; if not, the hotbed must first be put together, so that it may be ready to place the boxes in as soon as they are pricked out, as all checks must be carefully avoided. In making up the bed, let it be at least 2 feet longer and 2 feet wider than the frame, as it is thus enabled to retain heat much longer. The depth must generally be regulated by the material at hand. When finished, put the frame on, levelling the inside with the same kind of material as the bed is made of, to within a foot of the top of the frame; then fill in with equal parts of soil and rotten manure, and tread it down firmly, leaving it 6 inches in depth; then place on the lights, and in three or four days it will be ready for the boxes. A little ventilation at the top is necessary, and the plants will soon take hold of the soil. Watering and ventilation must both be regularly attended to, to keep them dwarf and strong. As soon as they have filled the soil with roots, take a sharp table-knife and run it down the centre of each row through the length of the box, cutting the soil down to the drainage. Three or four days after, cut them across the box, lift them out in a solid square, and plant them in the frame, about half an inch deeper than before, and 6 inches apart; then pack the soil firmly round each plant, damp them overhead with a syringe or fine-rose watering-pot, and keep close for a few days; after which give air gradually, till they get hardened, when it must be given more freely, according to the weather. Attend to watering the roots, and damp overhead on bright days early in the afternoon, and close the lights. The plants will soon touch the glass, when the frame must be raised, and a brick placed under each corner. When the leaves again reach the glass, a second brick should be placed on the first, and then they must be gradually hardened off, the lights being taken off altogether, when the soil will be a mass of white roots. About a week before you intend to plant out, tie each plant loosely round with a thin piece of matting, or any other soft material, and run a knife down the centre of the row, the length of the frame, and give a gentle watering to settle the soil in the cut. The trench must next be prepared by taking out a graft of 8 or 9 inches deep and from 24 to 30 inches wide, as Celery makes more side than tap roots. Fill in the trench with 6 to 8 inches of good rotten manure, that the spade will go through, and place 3 or 4 inches of soil on the top of this; take a four-pronged fork and mix them well together, covering 6 inches up each side with soil, and leaving a foot open in the centre to plant in. A good time to plant out is during the first three weeks in May. When all is ready

for planting out, lift the frame off the plants, cut them across between the rows with a knife as before, take them out in squares, and plant them in the prepared trench, about 1 inch deeper than they were previously, and 1 foot apart. Give them a moderate watering when this is finished, and they will not droop on hot days. See that the ties are loosened and tied afresh when required. Give water when required, and in dry hot weather damp them overhead every afternoon about 4 or 5 o'clock. If the Celery is required for exhibiting, when it has attained the height of from 18 to 20 inches, take a piece of strong paper 18 inches by 14, double it and make it 14 inches by 9, and place one round each plant; cut off the other ties, and put one round each end of the paper. This keeps the centre from turning green, and renders very little blanching necessary. A month before it is required for exhibition give it a thoroughly good soaking with weak manure-water, raising the paper 4 inches higher, and picking off all the leaves that would go inside the paper, as they go yellow and stain the Celery. Remove every lateral, and then carefully put round the soil 1 inch on to the paper. In seven days raise the paper 4 inches, and soil up as before; at the end of another week examine the centre to see if it is straight and free, and if the paper requires to be raised an inch or two do so; if not, soil up round the paper, but be careful that none goes inside, as it might damage the centre. As regards sorts, the best I know, either as early or exhibition kinds, is "Pollit's Laddie Colt Pink." It is very crisp and solid, and a delicate colour. The best white is Lady White, and is very similar to Wright's Grove White, that came out thus labelled. Sow red the first week in February and white about ten days later, as it is more apt to run to seed; but the best preventive is never to allow it to receive a check either in planting out or from want of water, and never on any occasion give strong manure-water, as it makes it spongy, deteriorates the flavour, and very often damps out the centre.

JAMES SMITH.

Waterdale, St. Helens.

The Chiswick Broad Bean Trial.—Some may think, perhaps, that the Chiswick Broad Bean trial, an account of which you have inserted, is a matter of little importance. To me, however, the report is most acceptable, for it substantiates what I have for a long time asserted to be a fact—that the old early Long-pod is the earliest variety we have. Nine out of ten people sow Mazagan for their first crop, and, if application be made to any seedsman for the seeds of an early variety, Mazagan is invariably sent. I always disliked this kind, and have always failed to see its value for any season. I have tried it in different localities, and always with the same bad result, and I have come to the conclusion that it is a poor, late, and altogether insignificant variety. No cooks care to have anything to do with it, nor does it give satisfaction when placed upon the table. If so, why is preference always given to the Broad Windsor? Why the Mazagan should ever have gained the reputation it has for being early is to me a mystery, but I am glad of the opportunity of endorsing Mr. Barron's report, and of exposing the error. My father, years ago, had the same low opinion of the Mazagan, and would neither sell the seed nor grow the variety. The Long-pod, I may add, stands frost well with us. Beans should be sown in rows 2 feet 6 inches apart, and 4 inches asunder in the row.

—J. TAYLOR, *Hardwicke Grange.*

Gherkins in Market Gardens.—These are sown about the middle of May in rows 4 or 5 feet apart, and the seeds are put in about 4 or 6 inches asunder. A good place for this crop, and one often devoted to it, is the alleys between the rows of spring-sown Cabbages or Radish beds. The alleys are dug over, the drills for the seeds opened in the morning, and the seeds are sown in the afternoon when the ground is warm. When the Radishes or other crops are cleared off the intervening beds, the latter are dug, and a line of Cauliflowers or French Beans is planted along the centre of them, or sometimes two or three lines of Lettuces are put in. Some sow the Gherkins on an open quarter in patches of three or four seeds together, in rows about 5 or 6 feet apart, and 3 or 4 feet asunder in the row. Hand-glasses are then placed over the seeds, and when the young plants have come above ground, abundant ventilation is given until they show flower, when they are fully exposed. Others sow a few seeds in the middle of the space between fruit bushes for about 6 or 10 feet into the brake, but no farther. Thus, being near the outside, they get plenty of air and light, and have, in addition, the shelter of the bushes. In many cases, however, they are now raised in frames and transferred to the open ground in June.—F.

THE FLOWER GARDEN.

ARRANGING BORDERS IN SEASONS.

To have a whole border bright in daily varying succession for a given time would be, I apprehend, a temptation to many to adopt this system of arrangement. It has withal many solid advantages, and a few of these I here note down, observing that our border, which may be called strictly a spring and partially an autumn one, has given us much instruction and enjoyment. However circumscribed the garden, it must have varied aspects, and to select the best for the particular wants of each plant is the first step; then collect together those of the same requirements, and one system of cultivation suits the whole. It is merely carrying outside the plan of indoor classification—stove, intermediate, and greenhouses, the shelf for succulents, the shady corner for Ferns. Without making our gardens into nurseries, or giving them the formal appearance of a botanic establishment, I do think a somewhat more systematic arrangement would be a gain for amateurs, as they would lose fewer plants, and economise labour. How often when a plant is received a vacant spot is sought for it, and there it is put for no other reason than that this empty space exists. Overcrowding in all departments is, without exception, the rule in small gardens. By arranging them in seasons, some progress would be made towards remedying weak points in the way of disposition. A border facing the north suits well for a spring garden, and a few trees in the background, of light foliage (Birch, Willow, Poplar), merely prolong the flowering of the Primulas, &c., by the thin shade they give in spring, and do more good than harm in very hot summers, when their leaves are fully out. One learns much while collecting the spring-flowering shrubs and plants, and the quest after some particular variety is very fascinating; great, also, is the satisfaction of having hunted it down, and of selecting the best variety, or, at least, that one which does best in your border; but, as seasons go on, withdrawing duplicates and such individuals as will not thrive must be done. You may be told to renew such year by year, and to keep to your plan of having every plant procurable in that season border; but this is wrong. It is a trial to part with *Menziesia impetrifolia*, *Polygala chamæbuxus*, *Daphne Cneorum*, *Dracocephalum altaense* of finest blue, *Primula integrifolia marginata intermedia*, *Trillium grandiflorum*, *Iris tuberosa*, *Narcissus Bulbocodium*, *juncifolius*, *Scilla bifolia rubra*—a long list, possibly, but your border will still be quite full, and the excluded plants will thrive in other spots of the borders. I would like well to have a spring rock garden. Until one sees how plants do thrive luxuriantly in their stone compartments, as arranged by Mr. McNab in the Botanic Garden of Edinburgh, where soil and aspect, shelter and drainage are all provided in due proportion to suit each tribe of plants, one has no idea of the true character of scores of beauties, unless one has had the good fortune to see such in their native habitats. No crowding or intruding on each other need ever arise, and Alpine treasures are there in abundance. But one cannot have everything, and we are well content with our border on the flat, and make the best of it. Although during spring that season's border has a profusion of flowers, during the next eight months it is positively devoid of them, and this is one of the greatest advantages of the plan, as one comes to learn what beauty there is in a healthy flowerless border. In July I have stopped to admire a group of the following: *Pæonia*, *Iris*, *Saxifraga cordata*, *Anemone sulphurea* (in feathery seed), *Orobis angustifolius*, *Waldsteinia geoides*—a plant which always pleases me from its different shades of green in the young and old leaves, which are also of interesting texture—and the grey deciduous *Sedums* of completely different forms. We have our borders arranged in rows for convenience of hoeing, and to know exactly where each plant is; but I know some prefer to plant their borders in groups, and the effect is perhaps less formal than it otherwise would be. The autumn border can only be partially so, for to have berries then, we must have had a spring of flowers; but we have collected such subjects as *Euonymus europæus* (Spindle tree), Privets, black and yellow-berried, and the autumn flowering one, *Ligustrum japonicum*, Crabs, *Cotoneaster* (we hope to get these into pillars and standards), *Pernetia*

(three sorts), *Leycesteria formosa*, *Escallonia macrantha*, *Myrica caroliniana* (for the autumn tints), old-fashioned and despised Roses that bear hews, the single white, only to be seen in cottage Kale yards (the double variety of which is considered the White Rose of Jacobite days), Scotch Roses with bunches of black fruit; *R. ferox*, with spiny stem; Rose of Sharon, some quite thornless and bearing very long hews, and others nameless to us, but all bearing fruit; Hollyhocks, *Helianthus*, *Phloxes*, *Asters*, *Lilies* (to be cool), *Rudbeckia*, *Chrysanthemums*, *Carnations*, *Pentstemons*, *Fuchsia*, *Scabiosa caucasica*, *Anemone japonica* (three sorts), *Spiræa callosa-alba*, *Snowberry*, *Marigolds*, and a number of plants that are not like these, consisting of many varieties. Brambles are trained up the Apple trees, *Rubus laciniata*, *reticulata*, *biflorus*, on whose white bark can be written its name and date; but I must own they all prefer to fruit on the wall. Mistletoe is on the Mountain Ashes and Crabs. Each February, I go round and smear suitable trees, so as to have this interesting parasite in all stages of growth. *Bryonia*, *Tamus*, and a Hop twine up the trees. The autumn border also faces the north, and thus prolongs the flowering of many species. *Asters* we grow in both our south beds to have them early, and in the autumn and north beds to spin them out. We cannot have too many *Asters*, and yearly add to our collection, weeding out as we pick up more attractive varieties. In the autumn border are introduced herbaceous Poppies, *Delphiniums*, tall *Campanulas grandis*, *pyramidalis*, *Van Houttei*, as there they form a succession reserve crop to those in the mixed south borders. All good useful plants should be grown in different situations. Their season of flowering can thus be prolonged for from four to six weeks. Lily of the Valley, Violets, and successive sowings of *Mignonette*, and other annuals, are grown in beds with this object; but a small garden cannot have beds of all that the owners would like to have. But, if you have a duplicate, look about for a warm and early, and a cold and late spot, and set one plant in each place. Our rule for these borders is to have only permanent plants in them. Thus Dutch Bulbs (so called) are excluded from the early border, and *Gladioli* from the late one. Annuals and biennials, with the exception of *Honesty* (purple and white) and *Marigolds*, from both. To ensure success with such borders, thorough working and preparation of the soil are essential, and not a day should now be lost, as the long storms have thrown such work behind hand in many districts.

F. J. HOPE.

Wardie Lodge, Edinburgh.

Different Kinds of Crocus.—Your correspondent "P." in his interesting list of bulbs now in flower in Mr. Barr's trial grounds at Tooting, gives *reticulatus* as a synonym of *Crocus susianus*. The true *Crocus reticulatus*, which I procured last spring from the neighbourhood of Trieste, is a white Crocus, striped with purple on the outside. In bloom it closely resembles *C. biflorus*. The bulb, of course, is totally different, and may at once be known by its conspicuously reticulated coat. I have reason to believe that till last year this species had been for some time lost to cultivation. Your correspondent also states that Mr. Barr has *C. hadriaticus* now in bloom. The true *C. hadriaticus* is an autumnal species. It blooms with me in October and November, and has long been out of flower. From the description, I have no doubt your correspondent alludes to *C. Weldeni*, Gay (possibly *C. biflorus coerulescens* of Herbert), a very pretty species, now just coming into bloom with me, and of which I think I gave Mr. Barr a few bulbs a year or two since, under the name of *C. variegatus*. It was so labelled by M. Max Leichtlin, to whose kindness I am indebted for the bulbs I possess. I have also received it from a correspondent at Trieste. The true *C. variegatus* is a variety of *C. reticulatus*. I have two varieties of *C. Weldeni*, one with pure white flowers, and another with the petals much suffused with bluish-purple. This latter I received as *C. dalmaticus*. I earnestly beg all sojourners and travellers in Oriental lands to send me bulbs of every Crocus they meet with. We have yet much to learn about this beautiful genus. I am determined, if possible, to grow every known species.—H. HARPUR CREWE, *The Rectory, Drayton-Beauchamp, Tring*.

Hepatica Barlowii and Cyclamens at Heatherbank, Weybridge.—May I call the attention of the admirers of spring flowers to the merits of the old, but not enough cultivated, *Hepatica Barlowii*? Besides the exquisite beauty of its mauve tint, the great length of its flower-stems make it show well up from the ground and in a bouquet. Our bed of hardy *Cyclamens* of many colours is now in full bloom, and, though quite unprotected, the severe frost of last night has had no effect on the blossoms.—GEORGE F. WILSON, Feb. 6.

DATE PALMS GARLANDED WITH PASSION-
FLOWERS.

WE are ever apt to follow in an old groove rather than strike out a new path for ourselves, and this is nowhere more apparent than in the planting or arrangement of our conservatories or winter gardens. The conservatory ought to be a beautiful indoor garden, containing as much natural beauty as is compatible with its necessarily artificial surroundings. Instead of this, it is, in too many cases, but little better than

a glass box, which is periodically refilled with decorative plants as required. This involves a large amount of trouble and expense, and is a great drawback to the amateur cultivator who attends to his own plants, and who is perfectly bewildered amongst a collection of flower-pots, decaying tubs, and a host of dusty and half-starved plants. Planting out does away with much of the extra trouble involved where repotting and watering have to be regularly performed. In many conservatories, both public and private, that are already planted with bold and characteristic vegetation, there is one element of beauty familiar to all who have seen the primeval forest in tropical or inter-tropical lands, or who have attentively read the graphic descriptions of tropical landscapes and natural gardens by the late Rev. Charles Kingsley, in his realistic letters from the tropics, or in his equally interesting book, "At Last." We allude to climbing plants, creepers, and trailers, as seen at home. Our treatment of these in our conservatories or indoor gardens affords us an excellent example of how we pursue the beaten

track, and still festoon the crystal roofs and domes of our plant houses with these most graceful of all plants, thus placing them where they have scarcely any chance of rendering their peculiar style of beauty conspicuous. Climbing plants under natural conditions have no such supports, but cling to other stouter, though scarcely less elegant, forms of vegetation than themselves; and the happiest way of employing them as decorative objects is to take advantage of this fact by planting them naturally in our plant-houses at home. Many tree Ferns and

Palms, Musas, and other naked stemmed forms of vegetation are rendered still more elegant if artistically draped with some of the countless forms of climbers now available for the purpose here indicated. At p. 33 of THE GARDEN, Vol. VII., is an excellent descriptive account of Passion-flowers, Ipomœas, Clematis, and numerous other beautiful plants, that would be all the better if trained in the way here indicated, that is, in houses that are light and well ventilated. Asparagus, Myrsiphyllum, Dictyopsis, Gloriosa, Fittonia, Gourds, and many other climbers of moderate growth, are eminently suitable for the bare stems of Cycads, tree Ferns, and dwarf Palms, as many of the Arecas, Seaforthias, and Chamædoreas. Even in damp, dark, and shady houses we have an abundant supply of dwarf-creeping Figs, Pothos, Selaginellas, Fittonias, Grasses, and Vines, and other foliage plants, which may be used in the manner here indicated with excellent effect.



Date Palms garlanded with Passion-flowers.

THE DATE PALM
IN BAGHDAD.

THE strip of alluvial land lying between the Arabian desert and the tableland of Persia and watered by the Euphrates and the Tigris, was once the garden of the world. In a communication made to the Linnean Society, respecting its present flora, by Surgeon-Major W. H. Colville, the writer has the following remarks on the cultivation of the Date Palm, for which this province is celebrated:—The only Palm in this country is the Date; but whether or not it is indigenous is a matter it would be useless to inquire into. The only place in which it could live a season in the wild state would be on the marshy border of some oasis in the desert, or near such a place as Busreh, where the ground would be watered by a tidal river. Here-

abouts a wild Date would be a greater curiosity than a wild camel; for it could not possibly exist with the scanty rain that falls. The natives, although they understand pruning and grafting, are careless in their cultivation of fruit trees generally. They never touch the Apple, Pear, Mulberry, or Apricot, but let them grow on, only giving them water. The Date tree, on the other hand, they have made quite a study. I shall give, as concisely as I can, the information I have gathered on this subject; for I am surprised to observe that even in the north of India, where experiments on the Date are carried on, more correct knowledge as to its

cultivation would appear to be required. In this province the Date tree is never grown from seed. Occasionally, it is true, a Date tree will be pointed out that has sprung from a chance seed and is suffered to live; but this is a rare curiosity. Till it is one year old it is impossible to tell whether it is male or female; and, should it be recognised as female by the leaf, a still longer time must elapse before it bears fruit. As a rule, it may be expected to be worthless, although now and then a good variety has been produced in this way. It is of no use selecting seed for sowing, for no one making a Date grove would ever plant a seedling, but would always take an offshoot. These offshoots spring from the parent tree at the junction of the root and the stem. The parent, itself originally an offshoot, throws out its suckers, one to five in number, but sometimes as many as twenty, from the second year of its independent existence to the time of its bearing fruit. The tree throws out these suckers only at one period of its life; and, should it bear fruit before any have appeared, it never has any at all. If the ground is good, the offshoot may be torn from the tree at two years; but, should it be poor, the shoot must be left attached a year longer. The shoot is a hardy thing, and may be thrown aside for a month after detachment; nay, I have seen some that were partially burned, and have been told that they were still good for planting, and were sure to grow. The shoot is planted in a hole 1 foot deep and the same in width; and care must be taken not to water it more than once in three or four days, else the young roots will rot. During the winter it must be protected from frost by a piece of matting, often for two years; and the earth must also be raked from the root and horse dung put in. At five years the tree produces fruit, but it does not reach perfect bearing until it is ten years old. The Date tree lives from a hundred to a hundred and fifty years; and it is said that some are now in existence two hundred years old, though they do not produce one-eighth of the fruit they bore in their prime. Two male trees are considered sufficient for one hundred females. Impregnation is performed artificially, but great care must be taken to give the dark varieties only a very slight sprinkling of pollen; and, although the light varieties require a little more, that must be sparing also, else the Dates will drop off before ripening. The young trees produce the most luscious fruit; but the Date will not keep or bear packing and transport till the tree bearing it is ten years old. The offshoots are, of course, of the same sex and variety as the parent. The male trees are, so far as is known, all alike; no difference has ever been discovered in any part of them, and no change has ever been detected in the fruit of any one female, although the males are used indiscriminately for impregnation. There are about a hundred varieties of the females, which can be discriminated not only by the fruit, but many of them by the leaf. The best Dates of all are grown at Il Hissah and Shitolah, oases in the desert, where fresh water gushes from the ground in abundance and spreads over the light soil of the desert with its dry burning winds. The next best are from Busreh, where the combined waters of the Euphrates and the Tigris, shut up twice a day by the tides of the Persian Gulf, overflow their banks and supply the trees with slightly brackish water. The soil in that neighbourhood is alluvial and saltish, and the air hot and moist. Although the Baghdadee sturdily maintains the excellence of his Dates, there can be no doubt that they are not equal, either in quality or quantity, to those grown further south; and the most luscious varieties, those with smallest stones and presumably from the most delicate plants, are not found here in so large a proportion as elsewhere. Baghdad, indeed, in lat. 34° N., is within a degree of the most northern limit of the Date. The variety Zadie produces the heaviest crops, averaging 300 lbs. weight to a tree. Each place has its different taste for Dates. Baghdad prefers the Sukri and Khustawieh, which is the highest crop of all. Constantinople imports the Zadie, packed in skins, and India the Khaderawie, Sair, and Brem, in baskets. These are shipped at Busreh, and are varieties not liked in Baghdad.

The Huon Pine (*Dacrydium Franklinii*).—This is perfectly hardy here. We have two trees of it which were planted in 1857, one of which is 10 feet in height and 16 feet in diameter, and both are excellent specimens. Has any of your correspondents larger plants of this Pine?—W. NANSAWEN, *Coldrick, Menheniot, Cornwall*.

Brickwork the Best Setting for Boilers.—However objectionable brickwork may be for a boiler setting—and Mr. Thomson (see p. 95) appears to condemn it thoroughly—there is no material with which I am acquainted which better answers the purpose; boilers when not set in brickwork soon part with their heat, which is lost in the stoke-hole; but when encased in good solid masonry, the bricks absorb and retain the heat that is thus lost. At the boiler trial at Birmingham one set in brickwork had its fire drawn out, and the doors and dampers thrown open, yet the water which it contained boiled for six hours afterwards—a fact worthy of note, inasmuch as I do not think a detached boiler could have retained its latent heat so long, especially as the weather at the time was anything but favourable. As to the position of the flow-pipes I shall refrain from making any remark until I have completed some experiments which I am making with a small boiler fitted up as your correspondent has suggested.—J. DEARDS, *Harlow, Essex*.

GARDENING FOR THE WEEK.

Flower Garden and Pleasure Grounds.

Ornamental evergreens and deciduous trees, on lawns and elsewhere, are not unfrequently disfigured, and sometimes irretrievably ruined, by the splintering of their boughs during high winds, when the boughs are rendered heavy by rainfall, or by a mass of snow adhering to them. Such species as the Cedar of Lebanon, and many of the Pinuses, are, from their style of growth, particularly liable to this misfortune, which timely attention, however, might in many instances avert. Before we are visited by the gales which usually accompany the vernal equinox, it is advisable to give attention to this matter. The large and heavy branches of trees such as those alluded to, naturally assume a horizontal position, and must consequently exert a very considerable strain upon that part of the tree where they leave the stem, or trunk. An examination of these parts will not unfrequently disclose rents or fractures of the bark, which, however slight, may nevertheless admit water; and if this be so, the evil will gradually increase, until the time arrives when the branch falls to the ground, sometimes with little or no warning, and then it is discovered that the mischief has been gradually progressing, probably for years. All that can be done under these circumstances is to smooth the unseemly wound, conceal it as much as possible from view, and exclude air and moisture by a covering of sheet lead, or zinc, which should be painted of a colour similar to the bark of the tree; or the place may be covered with Portland or Roman cement. Prevention is always better than cure, however, and such casualties may often be averted by covering anything in the form of a rent or fissure, however slight it may be, with sheet lead, zinc, or cement, in order to prevent the entrance of water; while support should also be given to heavy boughs by the use of strong hoop-iron or chains with screws and bolts if found necessary. And this may generally be done without being rendered conspicuous or at all unsightly, as supports placed upon the ground would necessarily be. If not already done, finish as soon as possible the transplanting of deciduous trees and shrubs, whenever the weather is favourable. Many planters, however, prefer the month of April for transplanting Hollies and evergreens of all kinds, and this, during most seasons, is generally accomplished with success. But such exceptionally dry seasons as that of 1874 proved exceedingly trying, particularly on light soils, to spring-planted trees and shrubs, and necessitates a vast amount of labour for watering; so that, taking one season with another, October may be safely considered as the best month for transplanting trees and shrubs of all kinds. The weather, until the last day or so, has been mild for the season, and some of our early spring flowering plants, such as the Snowdrop, Violet, Aubrietia, Forget-me-not, &c., are already beginning to be attractive. The quiet beauty of these early harbingers of spring generally commands an admiration which is not always accorded to their more gorgeous successors; and, in order to render the enjoyment of these early-blooming plants as complete as possible, the bed and borders containing them, as well as the walks and greensward by which they may be surrounded, should all be kept in the best order possible. The margins of walks and beds upon Grass should now be cut or edged, but, before this is done, all inequalities in the surface of the turf should be rectified, should any such exist; and the turf near the walks should be rendered as solid and firm as possible, whilst the margins, by the aid of pegs and lines, should be defined with the greatest accuracy.

Gravel Walks.

To keep gravel walks in good order, a slight coat of gravel should be given at least once a year; and this may either be done now, or may be deferred until the end of May, when it should be applied as soon as the bedding-out for the season has been completed. Before this is done, however, it may frequently be found necessary to remove a thin portion of the surface of the walks, which will sometimes be found to be discoloured by exposure to the weather, or green from the presence of some species of Moss; but this will, of course, depend much upon the situation of the walks and the nature of the gravel which had been used.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Roses.

Those who wish to improve their Rose beds and plantations should, as soon as the ground is dry enough, give the beds a good dressing of rotten dung and fresh loam. If a little bone dust can be procured, its application will greatly improve the quality of the flowers in the flowering season; bone dust, used judiciously, is the finest manure for Roses, but care must be taken not to use it too strong. I have generally dusted it over the ground as I do lime for killing insects, and this spreads the manure evenly over the beds and borders; they should then be forked over to a depth of 5 inches, or deeper still if

it can be accomplished without disturbing the plants so much the better. Take away all suckers while digging the beds, as they are more readily got at, without disturbing or injuring the plant when the ground is being turned over. Select a warm corner for Tea Roses if fine summer flowers are required, and trench it well, adding plenty of fresh loam and rotten dung, so as to plant a few pot plants out towards the end of this month for summer flowering. Fine exhibition blooms can be obtained from plants turned out in this way, and they can be lifted again in October for pot culture if required. Tie and train all pot Roses coming into flower. I recommend the young shoots of the Hazel for training Roses, as they blend more with the foliage than painted deal sticks, and are much cheaper. If one flower opens before the other when small plants are wanted for decoration, it is advisable to use a shade over the earliest blooms; a piece of brown paper or common newspaper answers the purpose, and is quite sufficient to exclude the sun's rays from them.—H. G.

Bouquet Flowers.

Covent Garden and other markets are now well supplied with cut flowers, amongst which may be enumerated Azaleas, Bouvardias, Camellias, Carnations, Cyclamens, Eucharis, Euphorbias, Gardenias, Heliotrope, Heaths, Lily of the Valley, Mignonette, Nemophila, Pelargoniums, Primulas, Roses, Snowdrops, Stephanotis, Violets, white Lilac, &c. With such a stock many effective arrangements may be made. Among the most useful flowers at this season for mounting hand bouquets are the different varieties of Cineraria, numbers of which are brought to market in a cut state; both the blue and rich purple tints, to be found amongst these plants, are most effective; the blue looks best mixed with white and green only, but the effect of the purple is enhanced by being associated with Orchids of a lighter shade, mounted so as to stand up above the other flowers; and, if a few spikes of Lily of the Valley be employed, a light and charming effect will be produced. Snowdrops, too, are well adapted for bouquet making, as they are much less expensive than Lily of the Valley, and answer the same purpose; indeed, they last fresh much longer than Lily of the Valley. Charming bouquets may be made with blue Nemophila, pink Pelargoniums, different varieties of white flowers, and Ferns; the best shade of pink Pelargonium for associating with the light blue of the Nemophila is the old pink Christine, so much employed for bedding purposes.—A. HASSARD.

Indoor Fruit Department.

Vines.—Turf stored in autumn for forming Vine borders may now be chopped up with a spade. This should be done under cover, if possible; if not, the soil should be protected from wet after it is cut up. This is easily done by throwing a tarpaulin over the heap. Where new Vineries are to be filled, the turves can often be wheeled into them, and cut up and mixed on the spot where it is to be used. If a sufficient stock of soil has not been obtained, the remainder may be procured now. As there is now little time for the Grass to decay, as much of it as can be got hold of should be cut with a scythe from the top spit before removing it. When this has been done, the turves may be cut about 15 inches square. The depth to take the soil should depend on the quality. If it is very old pasture, the fibre will be found to descend for 6 or 8 inches from the surface. If it is of comparatively recent formation, the suitable stuff may not be more than two inches thick. When cut up, the pieces should be about 2 inches in diameter. If any wireworms are observed, they should be destroyed before the Vines are planted. Kale stocks, with the leaves taken off, and rammed into the heap of soil, trap them effectually, and generally clears them out in a short time. Leave the stocks as long as possible, that they may penetrate well into the centre. Where a choice of soils can be had, the most calcareous should be taken, preferring that which contains a little clay rather than sand. See that the heat in the beds of fermenting material, which is giving warmth and protection to early Vine roots, does not decrease; and prevent this by working in fresh matter. This must not be neglected, although the fruit may be set.

Pines.—For these a lean-to house is the most convenient and servicable at all times and for all sizes of plants, excepting small suckers, which can be placed in low frames. The large houses should be constructed with a pathway up the centre, and a bed at the back and front. They should be at least 9 feet wide, to allow 3 feet for each of the beds, so that it may hold two rows of large plants each, and be divided by a 3 ft. pathway. Where the boiler can be got far enough down, it should be placed so as to direct a blow pipe up the bottom of each bed. The bed should be 2 feet deep, and the bottom of it, above the pipes, should consist of perforated metal plates, similar to those often used for the centres of pathways, when they are laid with grating. The heat passes much more freely through this bottom than through thick flags, which are much used; two flows and returns are sufficient for

heating the atmosphere of such a house; they should run along between the upright front and the front row of plants. Ventilators should be placed at both top and front to regulate the quantity of air. The height should be no more than will permit a person to walk upright, as it is not desirable to have the plants far from the glass. In such a house, those in fruit can be placed in the front bed, and the successional ones at the back, or *vice versa*. The back bed should be raised a foot or more above the level of the front one; this keeps the plants near the glass with the rise of the roof. The sucker frame may be provided with a single bed and heated at the top and bottom in much the same way as the large stove. When the panes of glass are 10 and 12 inches wide the plants are much benefited by light, and I prefer this width to the narrower ones, not only for glazing Pine-stoves but for all other structures.—J. MUIR.

Hardy Fruit.

Now that the weather is more favourable, planting operations should be no longer delayed. Those who have not completed their lists of Pears will do well to add Beurré de l'Assomption and Madame Treyve, both of which fruited here last season for the first time. The former may be described as a large Williams' Bon Chrétien, ripe at the same time, quite equal to it in quality, but without the musky flavour peculiar to that variety. Madame Treyve is also an early variety, very large and melting, and worthy of a place in all collections. If late ripening kinds are in request, the following are all excellent in quality:—Bergamotte d'Esperen, Easter Beurré, Josephine de Malines, and Ne Plus Meuris. All newly planted fruit trees, of whatever kind, should have thick mulching, the value of which cannot be over-rated. The pruning of all kinds of fruit trees may now be safely effected; indeed, should be finished out of hand forthwith, for, to say the least, it is unnatural to be cutting back a tree when the buds are ready to burst into full blossom. Sometimes pruning is deferred as late as possible, under the impression that early pruning induces early flowering, and, consequently, greater liability to injury from late spring frosts. In order to prove the correctness of this theory, a year or two ago, part of our Peaches on a south wall were pruned in November, and the others in February; both came into flower exactly at the same time, and, though both were good, those pruned the earliest broke, flowered, and set their fruit with greater regularity than the others. Late pruning is only to be recommended where birds are troublesome, and then only in the case of Gooseberries and Plums, the buds of which they are very fond of. In pruning Apples and Pears, save the cuttings of any kinds that it is desirable to increase by grafting, which must be done in March. The cuttings will keep perfectly if placed in the ground on the north side of a hedge or wall. Protection of some kind or other for fruit trees on walls should now be ready. Here, the walls have a coping projecting 15 inches, under which is fixed the frame-work for blinds made of scrim canvas, and, with the aid of rollers, pulleys, and strong sash-cord, the whole can be covered or uncovered in a few minutes. Such blinds are not only useful for protection when the trees are in flower; but, on sunny days at this season can be drawn down to retard flowering. Where, from the expense, such coverings are out of the question, procure long poles and place them against the wall at an angle of 45°. To these fasten hay or straw-bands lengthways, and 6 or 8 inches apart, for the admission of light and air. Two or three thicknesses of common garden netting are neater and better than hay-bands. A neighbour of mine, who has the use of large Birch plantations, most effectually protects the whole of his wall fruit with large flat branches of these trees, always selecting those with the most spray. He simply rears them against the trees, slightly fastening the thick ends in the ground. Evergreens, if they are to be had, will answer the same purpose.—W. WILDSMITH, *Heckfield*.

Kitchen Garden.

During the last few weeks the weather has been more favourable for pushing on outdoor operations and bringing up all arrears in digging and trenching. As every day will now bring its work, the exercise of forethought and diligence will be necessary in order to enable us to keep pace with the season. Plant out Bath Cos and other hardy kinds of Lettuce that have been wintered in sheltered borders; a single row at the foot of a south wall, between the fruit trees, will not do much harm, and in such a position they will turn in early. All warm sheltered spots may be utilised in this way for forwarding some non-exhausting crop for which there may be a demand. Sow the main crop of Parsnips in drills 15 or 18 inches apart; it should, however, always be borne in mind that unless the surface of the ground be in a mellow friable condition, it will be better to wait a few days. To plant or sow anything when the land is wet and unsuitable is very often labour in vain. Of course, the comparatively small space required for forwarding early produce can be so altered in texture and character by heavy and frequent

dressings of burnt earth and leaf mould as to be practically workable at any time; but with the larger sowings of the main crops, the case is different, and some soils that are of a retentive nature are in some seasons peculiarly difficult to manage, and after the snow and the mild damp weather of January, the land is not in so favourable a condition for planting and seed-sowing as it often is at this season; hence waiting and watching will be the best course to pursue. Take advantage of a favourable opportunity to sow in a warm sunny spot a few seeds of Snow's Winter Broccoli, Cocoa-nut Cabbage, Walcheren and Veitch's Autumn Cauliflower, Brussels Sprouts, and Green Curled Kale. Where any of the above were sown in autumn, they will now require to be pricked out, so as to have strong hardy plants to put out early. This is a good season for making new plantations of Rhubarb by dividing old roots either into single crowns or larger pieces. Do not plant too deeply, especially if the land be heavy. To obtain fine produce, Rhubarb should be divided and transplanted at least every four years. My own practice is to take up the four-year-old roots every year, divide a few roots for making a new plantation of the same extent elsewhere, and force the remainder. Unless there may be some special reason for grouping the Rhubarb into one plantation, single rows all across a quarter will be found more productive. A few of the earliest roots may now be covered with tubs or large pots, to shelter and forward them. Old cement barrels, with one end out, are cheap and handy for this purpose; and, when Rhubarb is covered up in this way, it not only comes earlier, but is of a beautiful colour and delicate flavour. If not already done, Globe Artichokes should be uncovered, leaving some of the shortest material as mulching round the base of the plants; fork between the rows to admit the air into the land, which improves its texture and condition. In very warm positions sow a few early Horn Carrots and Radishes. Mustard and Cress may be sown in quantities, as required, under hand-lights at the foot of a south wall or screen. In the forcing department, successions of Rhubarb, Seakale, and Chicory may be introduced to the Mushroom-house or forcing pit. The latest bed of Seakale should be covered with pots, if not already done, and a good covering of leaves placed over it—more, however, with a view to blanch than to force; therefore, there need not be depth enough to ferment. Late Seakale is often as desirable as early, and it may be obtained in this way as late as it is possible to have it; the leaves should be covered with long litter, to prevent them from being blown about. Seakale beds should always be outside the walled garden, where it will not become an eyesore.—E. HOBDAV.

MILDNESS OF THE WINTER IN THE SOUTH OF IRELAND.

WHILST gardeners, both in England and Ireland, have been put to their wits' end to save their plants in pits from frost, we have been almost free from its withering influence, and, instead of snowball and ice sports, we have been getting our usual winter supply of rain, not having been twenty-four consecutive hours without it for five weeks, although it has not been so heavy as we usually have it; 6.25 inches only have fallen in January. As it may interest some to know the results of the mild weather which we have been experiencing, and its influence on vegetation, I will just enumerate a few plants which we have in flower. The *Acacia affinis*, or Green Wattle, growing on south-east and south-west aspects, has been in flower for several weeks, and is still covered with hundreds of beautiful clusters of golden blossoms; *Clanthus puniceus*, or Glory Pea, a plant too often seen in a half-starved, red-spider-eaten condition, is growing here on a south-west wall in perfect health, and covering a space 30 feet long by 10 feet high; it would have easily covered twice as much wall had there been room. It has thousands of long racemes on it just ready to burst into flower. Surely this plant is worthy of more extended cultivation than it receives, inasmuch as it would well repay any little trouble which it might require in the way of protection in localities where it would not otherwise succeed. Camellias on walls of different aspects have been in flower for a long time, and *Cytisus atleeanus* is now covered with yellow blossoms. It has been growing out here for many years, and has a girth of 18 inches in the stem; I have also a large bush of a *Colletia*-like plant in flower, as well as the singular *Colletia bictonensis*, which is indeed past its best; also the pretty and fragrant aquatic *Aponogeton distachyon*, which has been in flower for months, and is still throwing up many blossoms. Fruit trees have likewise been influenced by the mildness of the season. Pears are ready to burst their flower-buds, and in some cases the bloom is quite expanded, while all other fruit trees are in a similarly forward state; Gooseberry bushes are quite green, but will, I fear, suffer from our usual cold high winds in March.

Fota, Cork.

W. O.

THE INDOOR GARDEN.

CALADIUM CULTURE.

THE Caladium is undoubtedly one of the most ornamental and attractive of our fine foliaged stove plants, and few convey a better idea of the luxuriance and splendour of tropical undergrowth to those who have never been in tropical regions. Some years ago Caladiums, like Begonias of the Rex section, were the rage; and, like most things in which people indulge to surfeiting, they have fallen off in popularity, their easy culture helping, no doubt, to affect this as much as anything else. Such a varied assortment of magnificent decorative subjects are not likely to be lost sight of, however, by those who have any appreciation for plants that are as useful as they are highly ornamental. Take the noble Caladium esculentum, for instance, which I have grown with leaves almost 6 feet in depth and 3 feet across at the lobes—no plant surpasses it for furnishing, in some situations, in halls and drawing-rooms. I have known it to be so much esteemed for such purposes that artificial specimens, copied from the natural plants, were made to take the place of the latter when they were not to be had. To have the plant in its beauty it must be grown with some care, and not, as it usually is, in stoves, far from the light, and where the leaves have to struggle up through a crowd of foliage upon spindly stems that cannot stand erect upon their own responsibility. Years ago one of the most select and best grown collections of Caladiums was to be seen at Dalkeith, in the Victoria-house there. The plants were grown with plenty of room and plenty of light, and, instead of plants with lanky leaves trailing over the sides of the pots, they were erect and symmetrical, the tints of the leaves well up, and the general development perfect. At that time we were restricted to the parents of the present numerous race, many of which appear to me to have run into each other too much to deserve a character for distinctness. The favourites were esculentum for a background, violaceum and others; then came bicolor splendens, picturatum, Chantinii, Belleymei, and the dwarf little argyrites, so well adapted for curb-stones and shelve edgings. The Caladium is not difficult to grow to perfection if it is treated liberally, and care taken to prevent the plants getting a check at any time, which is almost certain to arrest the development of the leaves before they have attained their full size, and no satisfactory growth is made after that. The roots should be shaken out carefully about the beginning of March, and the largest selected and potted, two, three, four, or more in a pot, according to the size of the bulbs and the variety. Large single roots of *C. esculentum* will sometimes require a 12 or 14-inch pot at the first; while the little argyrites, when grown for neat specimens, will only want a 3 or 4-inch pot for a number of its little bulbs the first shift. The pots should be carefully crocked, but not too deeply, and a soil consisting of two-thirds light turfy loam, one of well-rotted leaf-mould and cow-dung, and a considerable addition of silver or common clean river sand, according as the loam is light or heavy, will suit them well. The bottom layer of soil may be made moderately firm with the fingers; but, on the whole, they should be rather loosely potted, seeing that long fleshy roots, that give massive leaves and not flowers, are what should be encouraged. After potting, they should be plunged in a bottom-heat of about 75°, to begin with, in a stove or warm pit, and very slightly watered at first—or, indeed, not at all for a time, if the bulbs have been dried off during the winter, in which case they are exceedingly apt to rot off as soon as committed to the moist soil again. The roots will grow faster than the leaves at first; but, when the first leaves do appear, the plants may be copiously watered, for, though the Caladium is not an aquatic, it delights in abundance of moisture. As regards top-heat, a general and moist stove temperature will suit them well, according to the season of the year, and they must be kept in a good light, not far from the glass, and subjected to a free circulation of warm air, and shaded carefully on sunny days with thin canvas. Before more than the first rudimentary leaves have been formed, the plants will require a second and final shift; and much depends upon doing this at the proper time, as, if the roots are allowed to get at all matted before potting, the plants will receive a check, which will sadly interfere with the size

and beauty of the leaves. By turning a plant out of the pot, it will be seen how far advanced the roots are; and, when they are found pretty numerous at the sides of the ball, they may be shifted. Each variety should receive a shift into pots from 1 to 3 inches larger than the first ones. The soil should be of the same description as before, and have the chill taken off before using it. In potting, see that the roots are not disturbed in the least—only remove the crocks. Pot carefully, leaving plenty of room for watering, and restore the plants to their former quarters, until they have got established, when they may be moved into the plant-stove or house where they are to be displayed during the summer. Here they must not be neglected, or be allowed to become dry or shaded; they must have room, light, and air, and frequent waterings with weak liquid manure. With this treatment they will grow apace. Any flowers they throw up must be pinched out at an early stage, faded leaves cut off, and everything done to keep up and prolong a vigorous growth until the plants show a natural disposition to go to rest in autumn. From this period till the plants are started again in spring, some care is wanted to keep the roots from perishing with dry rot. It was once recommended to dry the roots off entirely during winter, letting them remain in the



Caladium Belleyi as a Vase Plant.

pots of course, and I believe this practice has caused the loss of many a valuable collection. Roots so preserved are more apt to decay than usual, and, as I said before, they are in great danger of rotting after being potted-off in spring. I knew of one fine collection that was nearly extinguished by this treatment, though the roots were dried gradually and kept on a stove shelf all the winter. More or less decay will happen, perhaps, under any circumstances, but I never knew it occur to any serious extent where the roots were never dried at all, but simply kept in their pots in some corner of the stove, and kept moderately moist, as we may suppose they will be in their natural habitat.

J. S. W.

Tree Carnations.—No time must now be lost in obtaining cuttings of tree Carnations; for, if required for next winter flowering, they must be propagated this month; later struck cuttings do not answer for winter flowering. It will be found that Carnations have made some good wood by this time where they have been grown in a favourable temperature. It is as well, after making cuttings, to lay them out for an hour or so before planting them in their pots so as to dry up the wound, and they are not so apt to rot off.—H. G.

ORCHID CULTURE, PAST AND PRESENT.

AMONGST flowering plants that have been introduced into this country for cultivation under glass, there are perhaps none that have attracted more attention than Orchids. The fantastic form of flower in a great number of the species, their exquisite perfume, and the blending of the gorgeous colours of many, together with a general appearance so different from all other plants, at once stamp them as the most singular of Nature's vegetable forms. So far as we can learn, occasional importations took place during the latter half of the last century, and at the commencement of the present they increased; but so little was attempted in giving them anything like the treatment they require that they used gradually to dwindle away. This was not to be wondered at, considering the atmospheric moisture necessary for their cultivation, and the comparatively dry condition in which plant-houses in general were kept, even at a much later date, as compared with the practice of the present day. Forty years ago there were very few collections in the country. Messrs. Loddiges, of Hackney; the Rev. Mr. Clowes, of Broughton, Manchester; Mr. Brocklehurst, of Macclesfield; and Mr. Lyons, across the Channel, who wrote a book upon their culture, were among the first to really study their requirements, and to form collections. The first three exotic Orchids I recollect seeing were the West Indian *Epidendrum* (*Epidendrum cochleatum*), *E. ciliare*, and the old *Bletia* *Tankervillei* (*Phajus grandifolius*). Then came *Cattleya Loddigesii* and the magnificent *C. labiata*. As collections were formed, it was no uncommon thing to see plants from the hot dry West Indian Isles (such as the three first named) associated with the cooler but more moisture-loving *Cattleyas* and others which were gradually brought into the country from the moist shady forests of Brazil. The drier light-requiring plants from the open prairies of Panama and Honduras, such as *Peristeria elata* and *Schomburgkia tibicinis*, *Dendrobium nobile* from China, other *Dendrobiums* from the hot and moist regions of India, and even the New Holland *Dendrobium speciosum*, were all made to conform, in a certain measure, to one uniform treatment. The result was that, although some flowered regularly, others never flowered at all, though often continuing to grow freely. Later on, in the manufacturing districts, there were numbers of those who shipped goods to India, China, South America, and the West Indies, who used to receive plants from their agents in those countries. These were usually consigned to a Pine-stove or early-forced Vinery, in many cases doing remarkably well; and a number of these plants, such as the East Indian *Aërides crispum*, might have been met with, as stout and vigorous as could possibly be desired, after being in the country for a number of years. Afterwards the plants from the different countries were in a measure cultivated separately, or, rather, such as required more heat and moisture were separated from those that wanted a cooler drier atmosphere, with more light and air. Then such species as the Dove plant (*Peristeria elata*) and the *Schomburgkias*, that had hitherto done nothing but grow when kept too close and without the light they required to solidify their growth as it was formed, were induced to bloom freely. Thirty years back the cultivation of these plants began to spread rapidly, and shortly afterwards were to be seen in many places in the country, as well as on the stages of the various horticultural exhibitions, plants that have never been surpassed, and some species that have not since been equalled. The dreaded disease known among the growers of Orchids as "spot" was little, if at all, known at that time, although the nature and requirements of Orchids were then in some measure not generally known. The disease has since been traced to mistaken ideas in their cultivation. It was no uncommon occurrence to see a man grow a number of plants successfully in a particular house, and be unable to manage them nearly so well if he removed them to another. It was thus evident that the accident of position, form, or light-giving properties of the house, separately or combined, had more to do with success than any knowledge possessed by the grower, which ought to have enabled him to adapt his treatment to the difference that existed in the house his plants were grown in.

Heat and Moisture.

Orchids will for a time bear more heat and moisture than are necessary or conducive to their well-being. This is evident to all who have had experience in their culture, and are observant as to the effects produced by the different conditions under which they are grown. For instance, the beautiful blue *Vanda* (*V. cœrulea*), from the comparatively cool and exposed regions of the Khasya Hills—which, if grown in a high temperature, with little air and light, quickly succumbs—will for years bear great heat if hung up within a few inches of the roof-glass. This plant is only one of many that are similarly affected. The mistake committed in the cultivation of these plants is very easily accounted for. Their high price and comparatively slow growth naturally made cultivators desirous of getting

them on as fast as possible; plants so grown have for a time a better appearance than such as are worked more slowly, making more and larger leaves, and possessing a darker shade of green. Nor do they at once show the ill effects of the treatment, but will go on for two or three years carrying their fresh deceptive appearance, getting the grower into a "fool's paradise" through the luxuriant green appearance of his plants. This goes on until the mischief—in a great measure irreparable—is done. They begin to show it by sap oozing in patches from the ruptured cells, which afterwards turn black, gradually eating away the leaves, and ultimately extending to the stems and pseudo-bulbs of the plants; after this, when badly affected, they rarely recover, although they may dwindle on for years. On more occasions than one I have been tempted, through low price, to purchase plants that have been slightly affected with this disease, and, by very careful treatment, such as keeping from them everything likely to excite or stimulate more than very slow growth, and cutting away the affected portions, they have in time overcome the disease, to all appearance leaving nothing but a new plant, so to speak, apparently quite healthy. Yet, I always found that such plants, however well they looked, if submitted for ever so short a time to any excess of heat or moisture, at once showed the disease in the most unmistakable way, giving proof that, although a new plant, as it were, was formed, at present completely severed from the affected parts from which it had sprung, the debility which produced the disease was nevertheless imparted to it, and ready to show itself under the least excitement. As I have attempted to show that this disease is produced by an insufficiency of light and air, accompanied by too much heat and moisture, so in general the shading material used for Orchids is thicker by half than it should be; and to this may be added the fact that the houses in which the plants are grown are not placed in a position to receive, or constructed so as to admit, all the light possible. The plants, again, are too often placed in the houses in a way to give the best effect, instead of being elevated as near the glass as possible, where, in addition to receiving the maximum amount of light, they would be situated where there was a continual motion of the air. I have invariably noticed that the healthiest collections of Orchids to be met with—not the greenest, or that made the largest leaves, but those that flowered the most freely without the barbarous drying shrivelling process often resorted to when at rest to produce bloom in plants whose treatment in the growing season (the proper time to impart to them the capabilities for flowering) had been the reverse of what was calculated to induce this disposition—were those that receive the most light, with plenty of air in the middle of the day, whilst making growth. Of course, this does not apply to exceptional plants like *Miltonias*, that cannot stand much light, but to the generality of the occupants of Orchid-houses, either from the eastern or western hemispheres. When Orchids receive a sufficiency of these two most essential elements, they will bear without injury considerably more heat and moisture. In respect to artificial heat, as applied to the different plants we cultivate under glass, it should be borne in mind that a given temperature—say 80°—applied to any plant in the confined atmosphere of an ordinary hothouse, exerts a considerably greater influence in exciting and forcing growth than the same degree of heat would have upon it in the unconfined open air of its natural habitat. Even the size of the house has a great deal of influence in this respect; the growth-exciting influence of a given temperature in a small house, when closed, is considerably greater than a similar amount of heat when applied to the same plants in a large house also closed. This I have frequently proved by several experiments. Consequently we must bear in mind that, although a plant in its native country, fully exposed to the open air, is subject to certain degrees of heat in the growing season, a lower temperature in the confined space of a glass-house will have an equal influence in exciting growth. That equally great errors have been committed in the unguarded use of moisture in the atmosphere of Orchid-houses, is also evident. To produce the greatest amount of moisture, many contrivances have been resorted to; there is one in particular which, because its influence is continually at work while fire-heat is going, has in no small degree contributed to this excess. I allude to evaporating troughs being fixed or cast upon the hot-water pipes. These are right in principle undoubtedly when not too numerous, or when too many are not kept filled in severe weather, when the necessity for keeping up a strong heat causes far too much aqueous vapour to be generated and to surround the plants; this is far more baneful in its influence than too much at the roots would be, if the pots are sufficiently drained, and the material in which they are grown is sufficiently open to allow of its escape. Some sixteen years ago or so, one of the leading London Orchid growers advised me, when next I was at Liverpool, to call at Hurst House—Miss Willis's place—a few miles out of town, to see her Orchids. I did so the next time I was in the neighborhood, and what I had heard about them conveyed only

an imperfect idea of the size, strength, and vigour of the plants. All I can say is that most of my preconceived ideas of Orchid culture were considerably upset. A description of some of the most remarkable plants, with the position they occupied in the houses and their treatment, will convey some idea of their excellence, and the very different treatment they received to the generality of these plants.

The Hurst House Orchids.

On arriving at Hurst House (an old-fashioned one), I soon found the gardener, who had grown the Orchids up to what they were; his name has escaped my memory, but he was a man considerably advanced in years, painstaking and unobtrusive—one of those individuals in whose company you cannot long remain without feeling a respect for them, through the absence of any disposition to boast of or exaggerate their own doings, even when such were visibly far above the common order. The principal range was composed of some four or five large hip-roofed houses, facing the south; the centre pits of some were filled with Pines and miscellaneous plants. The Orchids, in literal terms, were not a collection, but rather a selection of the best and most effective kinds, from both the eastern and western hemispheres. The houses were heated by very large flues—so far as I can recollect, some 2 feet wide—so large that a person might have crept up them. When a flue is made at the present day, it is in general not half large enough, and so gets over-hot and bursts, without giving off nearly the heat that a larger one would. These flues first traversed the front of the houses; on them were placed loose bricks, and on these rested strong slates overhanging the flues, and covered with sand; and on this stood the plants, which in the front of the houses were all large and grown in shallow pans, many of them 2 feet and upwards across. The front lights were some 5 feet in depth; consequently, except in the case of a few of the tallest, the sun had no direct influence upon them from the roof glass. There was not, so far as I could understand, a particle of shading of any description used, the plants remaining fully under the sun's influence, so far as its coming upon them through the upright front lights. The smaller plants and pendent-growing *Dendrobiums* occupied a broad shelf that overhung the back path in the usual position such shelves are generally to be met with in hip-roofed houses. My visit was in the beginning of May. On entering, the first plant that took my attention, standing on the already-described slate table, was a *Saccolabium guttatum*, some 4 feet high, and nearly as much through. It was a dense mass of breaks from the bottom to near the top, with short leathery leaves, and pushing over thirty bloom-spikes. It was by far the finest plant of *Saccolabium* I ever saw; although not a very good variety, yet nevertheless it shortly after changed hands for, I understood, £100. Near it stood some plants of *Aërides crispum*, 5 feet in height, with every leaf perfect down to the pot—a condition this fine Orchid is seldom seen in, even when not half this height; there were numerous side-breaks on them. Not far from these were several *Phalænopses*, *amabilis* and *grandiflora*, with from a dozen to fifteen short strong leaves to each plant; one of them, in addition to several flower-stems it was making, threw one up from the centre in place of a leaf—not an unusual circumstance, I understood, with these Hurst House *Phalænopses*. Amongst numerous *Aërides* in different varieties (which upon examination were, like these plants in their native country, pushing flower-spikes to every leaf they made), and other plants from the eastern regions, was a *Saccolabium retusum* with double-branched spikes, the longest of which was over 2 feet 6 inches. Not a bad idea of the quantity of flowers it bore may be formed from the fact of the first blooms which it had opened on the top of the spike being dead and fallen off before the point was so far developed as to show the individual flower-buds. Near it were examples of *Saccolabium Blumei*—not so large, but equally vigorous. On the back shelves the plants, although smaller, were as strong. I measured bulbs of *Dendrobium primulinum* over 4 feet in length. In the other houses, similarly arranged, were *Cattleyas*, such as *labiata*, *Skinnerii*, and *Mossiae*; several examples of the two latter, some 3 feet across, were completely covered with flowers, so as almost to hide the leaves. *Oncidium ampliatum majus* was in such size and condition as to be scarcely recognisable, with numbers of other fine plants in equally extraordinary vigour. In the houses where the East Indian plants were grown I had a pretty good clue to their treatment as to air by the state of the Pines, which showed, by their short broad leaves, that they were not stinted for air, which was taken off early through the growing season, and the houses thoroughly moistened at that time, but, in the middle of the day, everything was allowed to get quite dry—the night temperature, and that in the winter, kept considerably lower than usual for these Orchids. The *Cattleyas*, *Lælias*, and similar plants, were as short, both in bulb and leaf, as imported plants. The thick-rooted Indian varieties made comparatively few

roots above the surface of the soil, which was as different from what is generally used as could well be imagined, consisting of a mixture of fine sifted peat and old Mushroom manure, also sifted, with a liberal admixture of charcoal. The plants were kept drier at the roots than usual—no doubt a necessity when grown in such soil; for, if this material had been kept as wet as the ordinary Orchid soil, the roots would no doubt have perished, instead of which they filled the pots almost like those of an *Agapanthus*; but I do not attach much importance to the soil in which they were grown. It was the light, air, temperature, and correct balance of atmospheric moisture wherein the secret of success lay—a success that astonished everyone I ever met who had seen them.

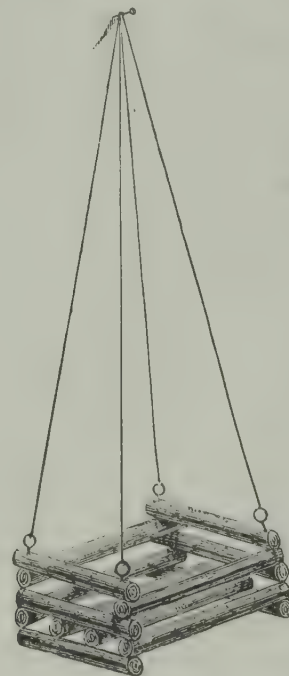
Rational Treatment.

Another individual with whom I have long been acquainted for years grew a small collection of the principal varieties of *Aërides* and *Saccolabiums*. They stood all the year round on a 3 feet wide table, on the front of an ordinary but very light plant stove, facing the south, without a particle of shade to the upright glass, and a very thin coating of paste on the roof. The whole of the lights on the front were hinged at top, and regularly through the growing season were opened every day, directly facing the plants, without anything to break or warm the air before it came in contact with them—a sort of treatment that most regular Orchid growers would have looked upon as sheer madness; yet, although shorter in the leaves, and not so deep-coloured, they carried their foliage, broke up young growths, and flowered in a way that similar varieties with ordinary Orchid treatment never do. But anyone who would try this more natural treatment should either commence with imported plants or such as have been previously grown with more light and air than are generally used; for plants whose every part had been formed under conditions that must of necessity make them much more tender could not be expected to well bear exposure to air and strong light such as described. Respecting these fine Orchids, *Phalænopsis amabilis* and *grandiflora*, how comparatively few there are who continue to keep them going on for years improving and increasing, as they will do when they receive the treatment they require. The secret of continued success with these plants is to keep them hanging as near the roof as possible, with a much lower temperature through the time they are at rest than the country they come from would lead anyone to suppose they would bear. I have in my mind's eye a lean-to house with a northern aspect, in the north of the kingdom, where these plants grow more like weeds than anything else, and yet I know for a certainty that the temperature all through the winter nights is nearer 55° than 60°; and this is by no means a solitary instance of successful culture in these plants. In Orchid growing, to be really successful, the plants should go on continuously increasing and improving, a good example of which is the magnificent *Vanda cœrulea* (see p. 43) exhibited by Mr. Smith, gardener to Mr. Lane, Badgemore, Henley-on-Thames, on the occasion of the Royal Horticultural Society's show at Kensington on Nov. 11. The plant, although not by any means a large one, consisted of two growths some 15 inches high, but clothed to the bottom with healthy leaves, and bearing five flower-spikes, on which were sixty splendid blooms. I understand that this plant has been in Mr. Lane's possession for over twenty years, and goes on yearly improving. This is what I look upon as successful Orchid culture, of a different description to that which occurs where the plants appear to do well for a time and then go off, simply by reason of their treatment being such as gradually undermines and exhausts the naturally strong constitution which the majority of these plants possess. What I plead for in the cultivation of these surpassingly beautiful plants is a rational system of treatment, by giving them much more light, with considerably more air, as also less heat and atmospheric moisture, than the generality of growers subject them to, with, for many, a lower temperature when at rest.

Orchid Baskets.

As the time is now approaching when most Orchid growers re-pot and place in baskets a considerable portion of their stock, a word may not be out of place on the comparative merits of the different pots and baskets in which Orchids are generally grown. All those plants, be they thick or thin-rooted, that in their native habitats grow upon the branches of trees, may be more or less considered as air plants, and there can be no doubt that most of them, were it not for the inconvenience attendant upon watering and inspection, and also the difficulty that would arise in giving sufficient strength to a roof to admit of a large number of plants hanging from it, would succeed better suspended near the glass than they do upon the stages upon which they are usually grown. That such is the case may be inferred from the way in which the majority of plants succeed that are hung near the roof, if their wants are fairly attended to as regards water and other matters; but, from their position, if any plant in a

house gets overlooked, it is almost sure to be one that is hung up. In support of this view, in respect to plants hanging, I may say that one of the best-grown collections of Orchids I ever saw was principally suspended in this way, with the exception of such varieties as are found growing naturally upon the ground; but, independently of this general view, there are some species that absolutely refuse to grow unless suspended; and such as the pendulous *Dendrobiums*, from their natural habit, require to be hung up. Baskets and blocks then become a consideration. Ordinary pots neither look well nor, from their weight, are suitable for this purpose. Many Orchids grow well upon a block of wood or in a basket made of wood, and both look well if the baskets are artistically made. But there is one drawback common to wood for this purpose, in whatever way it is used, viz., the rapidity with which it becomes rotten in the damp moist atmosphere of an Orchid-house. Anyone who will look at the habit of these plants, and notice the tenacity with which their roots cling to whatever they lay hold of, cannot fail to come to the conclusion that, of all plants, they are the least adapted by Nature for being frequently removed in a way that must necessarily involve a wholesale destruction of their roots. To avoid this, rustic earthenware baskets, made to imitate natural wood, have been invented, perforated and fastened together at the corners with wire, just in the way in which baskets are made of Maple or Oak. They are manufactured at Weston-super-Mare in sizes from a few inches up to such as will accommodate a plant of *Aërides* or *Saccolabium*, for both of which, as also for *Phalænopsis*, *Dendrobiums*, &c., they are well adapted. The great advantage in growing Orchids in



Rustic Pottery-ware Orchid Basket.

such baskets is that there never is occasion to disturb the roots, for, if a plant requires fresh material in the shape of peat and Sphagnum, nothing is easier than to remove all the effete soil, then take the syringe, and with tepid water wash the whole quite clean and free from any earthy matter that is getting in a condition unfit for the roots. Drainage in the shape of crocks, or, better (because lighter), wood charcoal, can then, if required, be introduced, filling up amongst the roots with the ordinary potting material; and if the plant requires a larger basket, all that is needed is plunging it, as well as the basket, into a larger one prepared with Sphagnum, peat, and the usual materials for keeping the soil open. That Orchids can, with the great advantage of never receiving a check in potting, be so treated I have found by in this way plunging such as were grown in shallow perforated pots; in larger ones, all that is required is to be careful that at each potting the old worn out soil is completely washed away, as described, with the syringe, which is very easily and quickly done, leaving the plant a short time to dry before placing it in another receptacle.

T. BAINES.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Convenient Flower Pots for Trellises.—It occurred to me the other day, whilst fixing a wire trellis to a pot, that it would be an improvement if some large flower pots were made with four or more pairs of small holes round their edges, viz., from the top of the rim inside to the bottom of the rim outside, so as to admit a small copper wire one-sixteenth of an inch in diameter, and about a quarter of an inch apart. In this way the ring at the bottom of the trellis could be more firmly fixed to the top of the pot. The four or more prongs generally attached to trellises do not hold them sufficiently firm, and the holes which I suggest, being small and neatly made, would be no disfigurement to the pots, which would also be useful for training Geraniums and other plants for purposes of exhibition.—THOS. MOUNTFORD, *Port Hill, Stoke-on-Trent, Staffordshire*.

Cutting-pot Maggots.—I have sent you a few specimens of a destructive maggot which has preyed upon some of my plants for years. It eats the pith out of my Geranium cuttings, which, in consequence, turn sickly, and die. It also attacks Chinese Primulas and some others. We watch carefully, and kill all we can find of them, but cannot get entirely rid of them; I think they breed in leaf-mould and other decaying matter and thus get into the soil. Can you furnish me with any remedy? Those sent, twelve in number, were all taken from a plant of *Primula denticulata*, the roots of which, when turned out of the pot, were found to be eaten asunder.—W. DIVERS, *Wierton House, near Maidstone*. [The maggots sent are the larva of the destructive beetle *Otiorynchus sulcatus*. Handpicking at the roots is the best remedy when they have established themselves in beds or pots; but for cutting-pots we should imagine that care in examining the soil used, and, where necessary, roasting it should keep the pots free from them.—A. M.]

TREES AND SHRUBS.

SOME FLOWERING TREES AND SHRUBS OF NORTH AMERICA.

By HARLAND COULTAS.

Stuartia virginica.—This beautiful genus consists of two species, well-deserving of cultivation as ornamental flowering shrubs. They have large handsome flowers which are white in *Stuartia virginica*, and have the five styles of the pistils united into one; but are cream-coloured, and rather larger, in *Stuartia pentagynia*, the five styles being separate. The last species is perfectly hardy in England, and at Philadelphia, and is found on the eastern slope of the Alleghanies in Virginia.

Gordonia Lasianthus (Loblolly Bay).—A fine tree, indigenous to swamps or moist turfy soils, growing to a height of from 50 to 80 feet, in the low country from Virginia to Florida, and ripening fine capsules as far north as Laurel Hill, Philadelphia. Its flowers are large, showy, white, and sweet-scented. This beautiful flowering shrub deserves to be treated with more care than it has hitherto received in England. The soil should be peat, leaf mould, or sand, and be always kept moist. The other species (*Gordonia pubescens*) has obovate-lanceolate leaves, pubescent beneath, and flowers almost sessile, but large, white, and fragrant. The capsule is globose, brownish, and ripens in October. It is somewhat hardier than the preceding species, but requires the same general treatment.

Magnolia glauca (Sweet Bay), called also Swamp Sassafras, Beaver-wood, and White Bay.—It is called Beaver-wood because those engineers and architects, the beavers, use its wood in the construction of their dams and houses. A shrub from 4 to 20 feet in height, growing in swamps from Massachusetts southward, near the coast. In the Southern States the flowers appear in May, and in the Northern States a month later. The flowers of the *Magnolia* are collected and sold in the New York and Philadelphia markets in the month of June. This elegant shrub or tree stands the climate of Europe well, and ripens its seed in the neighbourhood of Paris.

Magnolia acuminata (Pointed-leaved *Magnolia* or Cucumber tree), so called in allusion to its fruit, which resembles a small Cucumber. The leaves are oval, acuminate, and from 5 to 10 inches in length; the flowers, large, bluish-white, often with a tinge of yellow, are followed by a reddish fruit, which is highly aromatic and fragrant. This *Magnolia*, in the Alleghanies of Pennsylvania, is a splendid mountain tree, rising sometimes to a height of 120 feet, and growing at lower and more sheltered elevations in the forests of the Alleghanies mixed with other trees, from which it is most readily distinguished by its large dark green leaves and handsome flowers.

Magnolia grandiflora (Great Laurel *Magnolia*).—This species has thick evergreen leaves, from 6 to 12 inches in length, deep green, and shining above, and rusty-coloured beneath, with large deliciously fragrant white flowers. It is a native of North and South Carolina and Georgia, and endures the American winters as far north as Philadelphia. A truly noble tree, from 60 to 80 feet in height.

Magnolia Umbrella (Umbrella tree), so called because its leaves are crowded on the summit of the flowering branches in an umbrella-like circle. These leaves taper at both ends, and are from 1 to 1½ foot in length, glabrous, or smooth. Flowers, white, slightly scented. Cone of fruit, rose colour. Pennsylvania, Virginia, and Kentucky, along the Alleghanies. Height of tree, 25 to 35 feet. (*M. tripetala*, Michx.)

Magnolia Fraseri (Ear-leaved Umbrella tree).—This has leaves a foot in length, obovate-oblong, auriculate, or having two rounded appendages at their base, like ears. Flowers, white and fragrant. Tree from 30 to 50 feet high. Virginia, Kentucky, and southward.

Magnolia macrophylla (Great-leaved *Magnolia*).—The foliage of this handsome tree is truly magnificent, the leaves being from 2½ to 3½ feet long. Its flowers measure from 8 to 12 inches in width, white, and fragrant. It is a native of the Southern and some of the Western States, in rich and shaded woods, Florida to Tennessee. A small tree from 20 to 40 feet in height. The leaves and flowers of this tree, which extends itself into the zone of sub-tropical evergreens, and requires, for its growth, a mild and genial climate, give to its physiognomy a peculiarly exotic aspect.

Liriodendron tulipifera (Tulip tree).—Also sometimes called the White Poplar. This noble tree has been justly regarded by all who have seen it as the pride of the American forest. A special feature is given to its foliage, by its broad, lobed, and curiously truncated smooth leaf, the top of which appears as if transversely cut off. In America its stem is as tall and straight as the mast of a ship, growing without a limb to nearly 100 feet in height. Its shape, peculiar to trees crowded together in deep forests, and which has often been

described as the result of the action of top light, is perhaps most strikingly seen in the Tulip tree, which is easily known, even from a distance, by the straightness of its stem.

Celastrus scandens (Shrubby Bitter-sweet).—This is a climbing shrub, with a twining woody stem, allied to the European Spindle tree (*Euonymus europæus*). It is noticed because it is an elegant climber, and highly ornamental when trained upon trellis work or around the supports of a piazza, especially in autumn, when its open orange-coloured three-celled capsules display the scarlet covering of the seeds. The *Euonymus atro-purpureus* (Burning Bush) belongs to the same family. It is an upright shrub with deeply-lobed capsules of a deep red colour, which present a brilliant appearance after the leaves have fallen. The fruit is often introduced into autumnal bouquets, to which it makes a pleasing addition.

Cladrastis tinctoria (Yellow Wood).—A small but handsome tree, with yellow wood, smooth bark, pinnate leaves, and large white flowers, in terminal, drooping racemes. Rich hillsides, eastern Kentucky and southward along the western base of the Alleghanies.

Cercis canadensis (Red-bud Judas Tree).—Trees with rounded heart-shaped simple leaves, and red purple flowers appearing before the leaves, early in spring, in such abundance, that not only the branchlets and branches, but even the trunk itself, is clothed and empurpled with their clusters. This tree, therefore, deserves to be better known than it is, and to have a place among our cultivated ornamental trees.

Wistaria frutescens (Glycine, Carolina Kidney Bean, named in honour of Professor Caspar Wistar, of the University of Pennsylvania, Philadelphia).—A beautiful wall plant, a native of the alluvial soils of the Southern States. The lilac-coloured flowers are in large and handsome racemes, but are inferior in size and beauty to the Chinese species (*Wistaria chinensis*), which is much more frequently cultivated. The Chinese plant is not, however, so fragrant as the American.

Prunus americana (American Yellow Plum).—This tree is extensively diffused throughout the States from Canada to Texas. The stem is from 8 to 15 feet high, much branched; the flowers are white, and the fruit, mostly orange-coloured with a rich, succulent, yellow pulp, and a thick tough skin. In a wild state, the flowers are apt to be abortive, and the fruit is small and rather sour, but, by long culture, the drupes, when fully matured, become as large as a common Apricot, and have a pleasant flavour, but are not adapted to culinary purposes.

Prunus maritima (Beach Plum, Sand Plum).—This species is found along the coast from Massachusetts to Virginia, and often extends inland for more than 20 miles. When growing at a distance from the sea, its leaves are smoother and thinner and the fruit smaller, forms which have been considered, by some botanists, distinct varieties, and even species. It is a low straggling shrub, from 2 to 5 feet high, growing in little thickets, and, in exposed situations, it is nearly prostrate. The fruit varies in quality, but, when fully ripe, is usually of a very agreeable flavour, and is sometimes sold in the American markets. The Beach Plum is much used for preserving along the New England coast.

Prunus cerasus (Red or Sour Cherry, Morello Cherry).—The Sour Cherry is the most common, and, for culinary purposes, the most valuable of the native American Cherries. The Morello Cherry is a remarkably fine variety, with a rich purple juice. The stem of this tree is from 10 to 20 feet high, and supports a round bushy top.

Prunus serotina (Wild Black Cherry).—This tree attains its greatest perfection on the fertile banks of the Ohio, and other rivers of the West, where it forms a fine forest tree from 60 to 80 feet in height, the stem dividing into a number of branches and forming a widely spreading umbrageous mass. On the lowlands of the States, however, it only reaches to about half the height of the mountain form, which is placed in very different circumstances. It grows in the depths of the gaps and ravines of the Alleghany Range, closely surrounded by other tall trees, and as its lower limbs become shaded and atrophied, they dry up and drop off, the trunk or stem thus struggles up into a naked symmetrical shaft, the terminal branches forming a leafy summit or canopy, which continues to rise higher and higher as the mass of the forest rises in the air. A stem, often 5 feet in diameter, without a branch for 90 feet, and as straight as a gun barrel, is a common form of the plant in these woods, the height of the entire tree averaging about 125 feet. This is the Cherry timber so much valued for cabinet work. Wild Cherry bark ranks very high among the articles of the materia medica. The ripe fruit is a favourite food of birds, and is much used in the preparation of Cherry brandy.

Prunus caroliniana (Evergreen Cherry).—Tree, 30 to 50 feet high. Leaves, oblong-lanceolate, shining, evergreen. Flowers, small, white, and racemose. Banks of rivers, Florida to North Carolina. This tree is noticed on account of the poisonous nature of its leaves.

It is closely related to the European Cherry-leaved Laurel (*Prunus laurocerasus*), so common in English gardens, the leaves of which, when crushed, give forth the vapour of prussic acid, a deadly poison, and in sufficient quantities to destroy insects when confined with them. With this object in view, entomologists, when out collecting, carry crushed Laurel leaves with them in a bottle.

Pyrus coronaria (American Crab-Apple).—A tree from 15 to 20 feet high, having ovate and sometimes rather heart-shaped leaves, with large, rose-coloured, fragrant blossoms, and small sweet-scented greenish-yellow, extremely acid, fruit. This native Apple is in demand among American housewives for preserving.

Pyrus americana (American Mountain Ash).—This tree is prized in cultivation for its handsome autumnal clusters of bright red berries, which remain attached to the branches, after the leaves have fallen, even through the winter. Grows in the mountains of Pennsylvania and Virginia. It is closely allied to the European Mountain Ash (*Pyrus aucuparia*), which it greatly resembles.

Hamamelis virginica (Witch Hazel).—This shrub is remarkable for the singular fact that it does not bloom until its leaves begin to fall; hence late in autumn, the four long, narrow, linear, yellow petals of its flowers may be seen amongst its dying, fallen, obovate leaves, in clusters, where they remain upon its flexuose straggling branches for some time after they have lost their foliage. The twigs of the *Hamamelis* were formerly used as divining rods to discover water and metals under ground, by certain professional adepts in the occult art. The species are found in China and Central Asia, besides Northern America. This weird shrub, blooming so late in the fall, in the midst of the desolation consequent upon the decay of so much that is beautiful, is certainly worthy of cultivation, especially by the curious in such matters.

Chionanthus virginica (Fringe tree).—A beautiful tree or shrub, very ornamental in cultivation, belonging to the Olive family (*Oleaceæ*), having snow-white flowers, with long, linear petals, in loose, gracefully drooping panicles, from lateral buds. The petals of the flowers are 1 inch long, narrowly linear and acute, varying from four to six in number; grows in light soil, along river banks from Florida to Southern Pennsylvania.

Halesia tetraptera (Snowdrop or Silver-bell tree).—A shrub or small tree, growing in the Southern States, and also in the upper part of Virginia and Ohio, on river banks. The leaves are oblong, finely serrate, and smooth, and the flowers, which appear with the leaves in March and April, and which are very like the English Snow-drop, hang in beautiful snow-white clusters or short, axillary, drooping racemes from the branches, giving the tree in spring a very attractive appearance, and rendering its popular name at that time peculiarly appropriate. The other species (*Halesia diptera*) grows in the woods in rich leaf mould, away from rivers and streams of water. Both species well deserve extensive cultivation as ornamental shrubs.

Cornus florida (Dogwood).—This is a valuable as well as ornamental little tree, worthy of a place in every park and garden. Its stem and branches are altogether from 20 to 30 feet high. The flowers are greenish, in a head or close cluster, which is surrounded by a large and showy four-leaved involucre of bracts, white, inversely heart-shaped, and notched at their apex. This tree is quite common in the American woods, making a great display in spring when in flower, and an equally fine show in the fall when in fruit, as its branches are then covered with the clusters of bright red oval drupes which succeed the flowers, and its leaves are tinted beautifully with different shades of yellow, pink, and purple.

Catalpa bignonioides (*Catalpa* Indian Bean).—This is a common ornamental shade tree, cultivated in Philadelphia and other northern cities. It has large cordate, acuminate, entire leaves, and showy flowers, which are white, slightly tinged with violet and dotted with purple and yellow in the throat, appearing in July. Pods, hanging till the next spring, often 1 foot long. Indigenous in the South-western States.

ROYAL HORTICULTURAL SOCIETY.

THE annual meeting of the Fellows of the Royal Horticultural Society took place on the 9th instant, under the presidency of Viscount Bury. The Report which was read stated that the finances of the Society had occupied the serious attention of the Council, as it had been found impossible to make any reduction in the debt alluded to last year. Since the present Council had been in office, they had been called upon to pay debts previously ignored in the Society's published accounts. Sir T. Drake advanced, prior to 1860, £1,000 to the Society, without interest, and this debt had been compromised for £600. The ordinary revenue of the Society could not support its expenditure, although reductions had been made which would prevent

any increase of liability in 1875. The Council would have to pay rent to the Royal Commissioners in 1876, and the Fellows would have to make up their minds definitely either to risk the loss of the Gardens at South Kensington or to subscribe more largely. If the lease of the Gardens was voided, the debenture-holders would lose the sum of £50,000 advanced on the property. The balance-sheet showed that the income of 1874 amounted to £7,781 11s. from annual subscriptions and admission fees. Exhibitions, sale of garden produce, and miscellaneous receipts made the total income £11,673 3s. 2d. The expenditure showed £1,809 0s. 5d. for establishment expenses; special expenses in relation to horticulture, £701 4s. 5d.; Chiswick Garden expenses, £2,091 15s. 4d.; Kensington Garden expenses, £2,401 13s. 3d., and interest on debentures, £1,962 6s. 7d. The Royal Commissioners, it was stated, were willing to meet the Council openly and fairly. The Society did not meet its expenditure, and therefore it was necessary that some plan should be devised to improve the income. Sir Henry Thring said he was authorised by the Commissioners to state that they were not in the slightest degree hostile to the Society. It was their wish that the land at South Kensington should be kept as a garden. He did not approve the language of the report and hoped it would be referred back to the council, in order that some arrangement might be come to between the Commissioners and the Council. Mr. Shirley Hibberd moved that the report be referred back to the council for reconsideration. Dr. Denny seconded the motion, and said if the Society did not pay the rent of the Gardens next year the lease was liable to be voided. Mr. Edgar Bowring, C.B. (one of the Royal Commissioners), said from the moment the Commissioners were advised that the present council of the Society was a legal one they would be ready to enter into negotiation with the view of improving the Society's finances. After a long discussion the motion was withdrawn. The chairman said, considering the statements made on behalf of the Royal Commissioners, the council would consent to an adjournment of the meeting, with the view of considering the terms of an amicable agreement between the two parties.

ANOTHER CHARTOMETER.

THE accompanying little map measurer to my knowledge has been in use for nearly twenty years. The little milled wheel runs along a very fine screw from one side to the other. To use it, you must run the wheel close up to one of the shoulders, and then follow the road on the map. Should the distance be such as to allow of the wheel arriving at the next shoulder, you must recollect the exact point at which it stopped, and then retrace it along the scale which is attached to all maps. See how often the scale is traversed, and then proceed afresh. The thread on the screw being very fine, you will find that a considerable number of miles will be measured before the wheel arrives at the end of the screw. These little instruments are necessarily accurate, because the wheel must run back exactly as far on the scale as it went on the map. The price is only 3s. 6d., I believe; and they may be carried in a portemonnaie. I have drawn it the full size. I have been assuming that the distance wished to be known requires the wheel to run to the full extent and more; but it may probably happen that a third, a half, or any other intermediate measurement, is sufficient. In either or any case, you simply reverse it on the scale, and as soon as the wheel reaches the shoulder from which it started, you at once know the result.—"Field."



Ingratitude.—It is usually supposed that crowned heads and people of that sort invariably take all they can get in the way of earthly goods. A knowledge of this fact lately moved a person in Fulton, New York, to prepare a half-barrel of the soft and enticing compound called Apple butter, and to dispatch the same, as per address, to "Her Majesty Queen Victoria, Buckingham Palace, England." Such graceful and beautiful little attentions as this are what cement the bonds of humanity and shed a soft light of *tol-de-rol* over the dreary pathway of existence. It is to be hoped that this kindly gentleman will not have an experience like that of the Michigan farmer, who shipped a barrel of flour to the same crowned head not long ago, and while promising all his neighbours to show them the autograph letter of thanks, was slightly amazed to learn that his barrel had been sold at auction with some other unclaimed and less legal freight.—"New York Tribune."

THE HOUSEHOLD.

Cooking Rhubarb.—Rhubarb is best cut in lengths, boiled in water and sugar, and served with boiled Rice round the dish; or it may be treated like "Gooseberry fool." A little good cream gives it a delicate taste, which it never has in a pudding or tart. The following are excellent recipes for making Rhubarb jam and marmalade:—Cut the Rhubarb as if for tarts, and to every quart give 1 lb. of good moist sugar; put the sugar over the Rhubarb, and leave it twenty-four hours to draw out the juice. The sugar sinks, but does not dissolve. Boil the sugar and juice together for twenty minutes; after it begins to boil just at the edge of the pan add the Rhubarb, and boil slowly twenty minutes longer. There is no need to stir the syrup or preserve if slowly boiled. The Rhubarb and sugar do not require a warm place to draw out the juice. By this method the pieces of Rhubarb remain separate from each other when the preserve is done. It keeps good a year if kept in jars well dried and in a dry place. For the marmalade procure six Oranges, peel them, and take away the white rind and pips, then slice the pulp into a stewpan along with the peel, cut very small; add thereto one quart of Rhubarb, cut finely, and from 1 lb. to 1½ lbs. of sugar. Boil the whole down in the usual way, as for other preserves. Made in this manner, it is nearly equal to Scotch marmalade.

Tapioca (Manihot utilisima).—This useful starch is the produce of a plant that is cultivated extensively in the Malay Peninsula, where its culture is almost entirely in the hands of the Chinese. Tubers, which weigh on an average from 10 to 25 pounds, are first scraped and then carefully washed; after which they are reduced to a pulp by being passed between rollers. This pulp is carefully washed and shaken up with abundance of water, until the fecula separates and passes through a fine sieve into a tub placed beneath. The flour so obtained is repeatedly washed, and then placed on mats and bleached by exposure to the sun and air. It is finally converted into the pearl tapioca of commerce by being placed in a cradle-shaped frame covered with canvas; it is slightly moistened and subjected to a rotary motion, by which means it is granulated. It is next dried in the sun, and finally over the fire in an iron pan greased with vegetable tallow, when it is ready for the market.

French Pot au Feu.—Take a piece of fresh silver-side of beef weighing 6 lbs., and about half a pound of bones; tie up the meat neatly with string, and put both into a six-quart saucepan; fill it up with sufficient water to come well over the meat and bones, and set it on the fire; remove carefully with a skimmer the scum that will rise as the water gets warm, but do not allow it to boil. Add at intervals during the process about a pint of cold water in small quantities; this will have the effect of checking the ebullition, and will help the scum to rise. When the scum is all removed, put in about 1 oz. of salt, a small handful of whole Pepper and Allspice, one Onion stuck with a dozen Cloves, one Onion toasted almost black before the fire or on the hob, one Leek, and three Carrots of average size cut in 2-inch lengths, two Turnips of average size, each cut in four; and, tied together into a small faggot, two Bay leaves, two or three sprigs each of Thyme and Marjoram, a clove of Garlic, and a small handful of Parsley. The above vegetables should not be put in all at once, but gradually, so as not to check the gentle simmering of the *pot au feu*, which should be now skimmed for the last time, and placed by the side of the fire to simmer gently for at least four hours. According to the season, all or some of the following vegetables may be added; a head of Celery cut in 2-inch lengths, a couple of Tomatoes, a couple of Parsnips, a handful of Chervil. At the time of serving strain the broth and skim off all the fat, add the least bit of sugar (not burnt sugar), and more salt if necessary; make the broth boiling hot, and pour it into the soup-tureen over small slices of toasted bread, adding, according to taste, a portion of the vegetables cut in thin slices. To serve the meat, having removed the string, garnish it with some of the vegetables, or with mashed Potatoes, Spinach, &c.

THE LATE MR. W. P. AYRES.—The widow of this well-known horticulturist having been left wholly unprovided for, some of his friends have determined to raise a subscription for her benefit. I am confident that many who remember the services rendered to horticulture by Mr. Ayres, both personally and by his pen, will be ready to lend their assistance towards the accomplishment of so charitable an object, and will be only too pleased at having an opportunity of doing so. I would rather not receive subscriptions myself, but I have no doubt that the editors of our horticultural papers would, if requested, gladly do so, and I am ready to give what I can afford for the purpose in question.—JNO. WILLS, Onslow Crescent, Onslow Square, Brompton.

MR. JOHN BELL died on the 3rd inst. at his residence, Heath Cottage, Thorpe Hamlet, Norwich, aged seventy-one. For thirty-nine years he was a nurseryman and seedsman in that city.

NOTES AND QUESTIONS.

Double White Primulas.—I should feel obliged by some of your readers telling me how to grow these lovely winter flowers in perfection.—PRIMULA.

Sulham Prize Celery.—I have this season grown a couple of rows of this truly exquisite Celery, and I find it to be an excellent keeper, and to possess the true nutty flavour which Celery ought to have. It is not large, but it is compact, tender, and in all respects an admirable variety.—R. GILBERT.

Fertilising Aucubas.—In addition to what was stated in reference to this subject in your last year's volume, allow me to say that two years ago I planted from a pot a small male Aucuba, and last year eight bushes, twenty or thirty yards off, some of them 10 feet in diameter, of the female sort were so covered with berries that half a bushel might readily have been picked from them. Last spring the frost appeared to have killed the male flowers, but all the female plants have, nevertheless, borne a great many berries.—W. BURN, *Chilts Hill, Wood Green.*

The Best Scotch Firs.—Permit me to say, in answer to your North-country correspondent's objections to my remarks in regard to the natural woods of Fir and Pine in Norway, that he furnishes an additional illustration of their correctness. I said that finer examples of Pine and Fir could be found in almost any English estate than their native (*i.e.*, Norwegian) woods afford. By English I meant, of course, the United Kingdom. Your correspondent does not seem to know that *Pinus sylvestris* is as much a native of Norway as of Scotland, and might as justly be called the Norway Pine as the Scotch.—W. INGRAM.

Propagating Roses.—After my Roses in pots have done flowering I see them round some heaps of potting mould and layer all the shoots on the sides of the heaps, giving them at the same time a sharp bend so as to cause a slight wound. By the end of October they will be found to be well rooted, when the strongest of them are potted and plunged in a slight hotbed, the tops being, however, exposed in order to encourage root action; the small ones are planted out in a nursery bed until they are wanted for pot culture or for planting in beds. This method of increasing Roses may not be new, but it is a good way of utilising wood which would otherwise be cut off and thrown away.—WILLIAM NEANE, *The Gardens, Hampton Court House.*

Propagating Mistletoe.—Save the berries, get them well dried, and insert them in the bark of the selected tree after the fashion of budding Roses, the sap in the tree being up. Mistletoe, as a rule, grows best on decayed Apple trees; and it seems common in the south of Gloucestershire for it to abound in trees which have passed their best, growing on the decayed parts most freely—the birds no doubt carrying the berries. I have myself this Christmas seen a very small sprig sold for 2s. 6d. in the north of Gloucestershire; here in the south the owners of orchards and plantations would freely give it to a man who would remove it carefully from their trees. It is very injurious to every kind of timber, and quite a poison to cattle. It would seem, however, that during the late frost the birds have freely partaken of the berries, so as to leave but very few for purposes of propagation.—"Field."

Proposed Potato Exhibition.—An effort is being made to establish the nucleus of a permanent Potato exhibition in or near London. That well-known grower, Mr. Peter McKinlay, of Beckenham, has taken the initiative by issuing, to all interested, a circular inviting co-operation and support in the matter; and so great is the interest now felt in the cultivation of the Potato amongst all classes of persons, that there can be little doubt the response will be general and hearty. It must not be forgotten that whilst the Potato receives encouragement at almost every Provincial Show, large or small, yet that now, when the South Kensington November exhibition has been abolished, not a penny is offered for its encouragement at any Metropolitan Society's Exhibition. Of course the prizes so liberally offered by some of our eminent seed firms are not overlooked, but these are wholly independent of societies. Should Mr. McKinlay be satisfied with the way in which his circular is met, a thoroughly representative committee will be at once formed and a liberal schedule of prizes issued. It is hoped that the show may be held at the Crystal Palace; but in any case it is earnestly to be desired that a really national exhibition of this valuable tuber may be the result.—A. DEAN.

Nepenthes at Drumlanrig.—At p. 360, Vol. VI., of *THE GARDEN* you refer to some "well grown" pitchers from these plants which you received through Messrs. Veitch. I saw the plants in question late last autumn; the principal ones occupy a hot moist end of a large exotic plant stove. They are all growing in remarkably small square baskets made of unpeeled Hazel sticks, and the roots derive their support from pure living Sphagnum. The Sphagnum is in a thriving state; it was about 4 inches in length, and so strong that each spray would have stood upright itself. It grew out of every nook and corner of the baskets, and hung over their sides in verdant masses. This is evidently the company the *Nepenthes* delights to be in. The plants are good examples of high culture, and they show how perfectly they may be grown in a common plant stove. The following are the chief varieties grown at Drumlanrig:—*N. Rafflesiana*, *N. gracilis* major, *N. Sedeni*, *N. Hookeri*, *N. phyllamphora*, *N. Dominii*, *N. hybrida* maculata, *N. rubra*, and *N. distillatoria*. The latter is trained up and goes the full length of a 22 feet rafter. Dozens of pitchers that would hold a pint hang down in grand profusion, and indicate how well adapted this variety (which is sometimes grown under the name of *N. Khasyana*) is for climbing. The other varieties mentioned were suspended from supports put up for the purpose.—J. MUIR.

Draining Gravel Walks.—I am desirous of draining my gravel walks upon the plan recommended in the *GARDEN* for January 30, p. 91; what diameter of drain pipes should I use? and how far apart should the "eyes" be? I conclude these eyes are a small sort of cesspool; can you give a hint as to the cheap construction of such "eyes." The walk is 6 feet wide, and is about 100 yards in length.—S. [The size of piping required to drain a hundred yards of walk supposed to be continuous—consequently all the surface water from the whole length would have to be carried through the pipes to the main drain of the garden—should be 4 inches in diameter to ensure the water being carried off as quickly as it falls in heavy thunder showers; or even pipes 6 inches in diameter might be necessary if any considerable portion of lawn, or other ground, slopes towards the walk, which would receive the surface water from such surroundings. On a walk that is nearly level the eyes should be placed on each side, at intervals of 25 yards or so; but if the descent is rapid, giving the water considerable force, they should not be above half that distance apart. The cheapest way of making them is with common bricks, built up so as to form 4½ inch square openings or eyes, on the top of which place the ordinary iron grids that are about a couple of inches larger than the eyes, which consequently give them a bearing. They should, if possible, be let into a square wooden frame lying on the top of the bricks, or still better one of stone and similar in shape; if merely laid upon the bricks which form the eye they are liable to get displaced every time the roller passes over them.—T. BAINES.]

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

DECIDUOUS TREES IN WINTER.*

By JAMES M'NAB, Royal Botanic Gardens, Edinburgh.

WE often meet with people who are utterly incapable of discriminating between the various kinds of forest trees when bare of leaves, although they may be in the habit of walking daily through forest scenery. A very general belief, in fact, seems to prevail that it is impossible to distinguish trees when stripped of their foliage. This, however, is far from being the case, as I shall presently show. The pleasures of a country walk in winter may be greatly enhanced by a recognition of our summer friends amidst the bare trunks and leafless branches that surround us, and it is always an enjoyment, when visiting any country district during the winter months, to be able to tell every tree as it comes into view. To the amateur landscape painter, the winter study of trees is highly essential, although I am afraid it is rarely entered upon before attempting to delineate them on canvas, and this want of observation, or rather the want of the technical knowledge that observation alone can give, frequently leads to their being incorrectly represented. It is quite possible to paint trees in a winter scene (when they are free from snow) so as to render them as easily recognisable by an experienced observer, as they are, or ought to be, when the more noticeable characteristics of their foliage are depicted. Even in the case of the Birch, it is not its graceful outline and the general disposition of its spray, composed of small upright, diverging, or pendent twigs, of a uniform thickness, that usually determine its identity, but the peculiar white bark, which is common to the species at all seasons. The same general remarks are also applicable to many summer landscape effects. While looking over the exhibitions of modern pictures, how seldom do we find representations of trees which enable us at a glance, and with absolute certainty, to name the original. The Scotch Fir, Lombardy Poplar, and Birch can generally be recognised, although the fine delicate foliage of the latter is not at all times discernible; and even with the Lombardy Poplar, characteristic as it is, the diameter of its fastigate branches is rarely seen in proportion to its height. The massive round head of the Sycamore or Plane tree, when truthfully portrayed, is easily detected; but even this tree is often represented as sectional, light being often too freely seen through the branches and leaves, which ought not to be the case with any ordinarily well-developed specimen. There is something peculiar in the general outline of almost every kind of forest tree, both in their winter aspect and summer garb, which amateur artists ought particularly to study. The general disposition of the branches, and arrangement of the spray, as well as its openness or density, is always well marked in the different species. It would be easy, at this season of the year, to get correct photographs of good typical specimens of forest trees, to be kept in view while painting any particular tree in a winter scene, so that the arrangement of the chief, as well as the secondary and terminal branches of each kind, should be properly represented as to their density or openness, as well as the relative distance of that density from the points of the branches of each species. The same remarks are also applicable to the summer condition of many trees, photographs being kept for the same purpose, not that the trees should be painted from the photographic representations, but, where we find something definite in the outline, as well as the general thickness, tapering, and divergence of the branches and spray of the different species of forest trees, it is essential that such characters should be kept in view while delineating any particular species. Another fault, and one which is very often observed in pictures, is the relative heights of many of the kinds represented when compared with the diameter of their stem and head. This is the more observable when they stand near objects such as cattle, well-known herbaceous vegetation, &c., with the size of which we are

familiar. Many forest trees are easily recognisable by the texture of their bark, which may be smooth, rough, corrugated, or in flakes. There is no difficulty in distinguishing the Beech, Elm, Lime, Birch, Chestnut, and Scotch Fir, that is, if all the trees are matured; but the foliage does not, in some paintings, always correspond with the bark. Not many years ago a picture was exhibited representing the corrugated bark on the stems of the old Sweet Chestnuts at Fontainebleau. Some of the points of the branches exhibited foliage; but, instead of the leaves being those which belong to the common Chestnut, all were those of the Horse Chestnut, a different tree, with a totally different arrangement of leaf. I shall now endeavour to give a few descriptive remarks on the general arrangement of the terminal branches and spray of some of the well-known forest and ornamental trees usually introduced into pictures; these remarks apply more particularly to their appearance during the early winter months. As the season advances they become more dense, owing to the gradual swelling of the young buds. The practised eye, however, is always enabled, from the disposition of the spray, to recognise them in their different stages. The Ash tree has frequently an irregular outline of head, generally with long undulating branches, particularly on trees standing free. The twigs are somewhat dichotomous, thickened at their points, and project considerably beyond the secondary or side spray. The spray has a loose appearance, and shows a uniform openness all over the tree. The Beech tree has generally a well-developed and regular outline, the main branches tapering gradually from the stem to the points. The points, for the most part, proceed at right angles from the branches, and have an undulating appearance. The side spray is short, and generally turns upwards. The extremities of the branches, for about 3 or 4 feet all over the tree, show a uniform lightness. The bark of the tree is very smooth, and generally of a grey or leaden colour. The Birch, when standing free, has often a regular and very graceful outline. The points are principally composed of small twigs of a uniform thickness, either upright or weeping, generally showing a somewhat netted appearance. The surface of the stem is well known by its white-coloured bark. The Horse Chestnut generally shows a regular outline, composed of numerous sturdy branches, the lower ones drooping. The branchlets are by no means crowded; a foot or two of each of the points is observed to turn upwards. They are strong, of a uniform thickness, and somewhat open and regular all over the tree. The bark is of a greenish-grey colour, and partially roughened. The common Chestnut, when standing free, has a regular outline of head, the branches strong, and more or less pendent. The extremities are numerous, and all thickened towards the points. Although the main branches are pendulous, the points are generally bent upwards, and show a uniform thickness all over the tree. When old, the bark assumes a somewhat corrugated and rough appearance. The outline of the English Elm is frequently very irregular, most of the branches projecting upwards, some considerably beyond the rest. The terminal spray is more or less upright, very twiggy, and with a confused appearance, the darkest part being 10 or 12 inches below the points of the twigs. The bark is generally of a dark and rough nature. The outline of the Scotch or Wych Elm, although somewhat regular, has the upper branches, as well as the spray, in long forked lengths, more or less diverging. On this account it frequently receives the name of the Y tree, from the branches resembling that letter. About 2 feet from the points of the branches is generally the most open part, and this is the case all over the tree. The outline of the Lime tree is regular and the head somewhat rounded. The spray is thickest about 1 foot within the general outline. The terminal branches and spray are upright, and the lower side branches more or less drooping, but all have a tendency to turn up at the points. The bark is somewhat smooth, and generally very green, being covered with a small fungus known as *Chlorococcum*. The common Oak has more or less an irregular outline. The main branches, as well as the secondary and terminal ones, generally diverge very much; the points of all protrude from 2 to 5 inches beyond the numerous semi-whorles of small side spray, which generally incline upwards. The bark is rough, and of a dark colour. The Turkey Oak is generally very tall, with an

* Read before the Botanical Society of Edinburgh, 11th February, 1875.

irregular outline; the main, as well as the top branches, more or less erect, and generally in long straight shoots, their sides being covered with spray a few inches long. The general density of the spray is by no means great, but very uniform all over, except at the points, which are long and stand free. The black Poplar has rather an irregular outline, composed of large massive limbs, the smaller branches ramifying much towards the points, giving the outline of an old tree a somewhat netted appearance, but always thickest about two feet within the general outline. The Robinia has a very irregular shape; the main branches generally assume a tortuose or zig-zag appearance, which is observable even at the extreme points. The branchlets and spray are short; a uniform lightness is observed all over the tree. The Sycamore, or Scotch Plane, has generally a regular outline, composed of large massive branches, each portion being more or less rounded, and terminated with numerous tessellated points, mostly turned upwards and slightly thickened, generally darkest round the outline of the tree. The bark is frequently green with chlorococum, and somewhat roughened. The outline of the Walnut is often very irregular, and branches much. Many of the branches, as well as the tops are somewhat dichotomous. The terminal, as well as the side spray is strong, and has a uniform openness throughout. The Willow, when seen large, is generally composed of low bending stems, their points assuming a slightly elevated habit, which as they ascend, the upper portions become more or less erect; a uniform openness is observed all over the tree.

NOTES OF THE WEEK.

— MR. J. TYERMAN has sent us, during the past week, a box of Narcissi, which are now flowering freely in the open air at Tregoney, Cornwall. The collection includes *N. Pseudo-Narcissus*, *N. Telemonius*, *N. minor*, *N. minimus*, *N. Tazetta* (a fine large form with golden-yellow cups), and the true *N. intermedius*, with stellate golden flowers, semi-cylindrical deep green foliage, and smooth cylindrical scapes.

— WE have received direct from America a most excellent sample of canned Tomatoes of the "Bordentown" brand. These are grown and preserved on the Bordentown Fruit Farm, New Jersey, and are far superior to any we can obtain in London, the flavour being equal to fresh fruit when fully ripe, and far superior to fruit grown in pots indoors during the winter season.

— FOR the article (see page 157) on the Vine pest now devastating the Vineyards of France, we are indebted to Professor Riley, of St. Louis, the State entomologist for Missouri, who has paid much attention to this minute, but terrible, pest. The article cannot fail to be useful for reference to all who have to combat the attacks of the Phylloxera.

— AT the last meeting of the Royal Horticultural Society (Wednesday, 17th inst.) a first-class certificate was awarded to the Rev. George Kemp for a dish of *Beurré de Jonghe* Pears, in very fine condition for the season of the year. The delicious flavour and fine keeping qualities of this fine Pear ought to make it a favourite with amateurs and fruit-growers for market.

— *SAXIFRAGA BURSERIANA* and *S. pyrenaica rubra* are now in flower on the rock-work in the York Nurseries. *S. Burseriana* has pure white, almost circular, flowers, borne on slender pubescent scarlet stems, from 1 to 2 inches high. This Saxifrage is a beautiful object for many weeks even before the flowers expand, the buds, when they first appear, being almost scarlet, which slowly changes to a dull red when the flowers begin to expand. The stems remain scarlet throughout the flowering season. *S. pyrenaica rubra* belongs to the opposite-leaved section, but has upright rosettes and large deep crimson flowers, which slightly change with age to a lighter crimson. It is a very fine variety.

— THE laying out of Cannonhill Park, Birmingham, is being pushed forward with vigour. Between sixty and seventy workmen are at present engaged in operations which, when completed, will add both to its beauty and utility as a recreation ground. A new lake, diversified by islands and bridges, is to be formed, which will cover an area of between 4 and 5 acres, and on its southern shore, extending its full length, it is proposed to raise an artificial mound, from which the whole of the cricket ground and other important features of the park will be overlooked. In addition to the excavations going on at the lake, the turf on and around the croquet-lawn is being relaid. Mounds will here and there be raised, trees planted, and a large extent of new shrubbery formed. These alterations, from designs

furnished by Mr. Marnock, are being carried out, under a contract, by Mr. Meston, at the expense of Miss Ryland, the donor of the park. The whole of the works are expected to be finished about midsummer.

— FOR the sake of our illustrations—both coloured plates and engravings, readers who obtain THE GARDEN through newsagents, booksellers, or at the railway bookstalls, should request that the paper be delivered in an unfolded state.

— IT has been determined to hold the next meeting of the American Pomological Society in Chicago, and it is expected that the meeting there will be of more than usual importance.

— THE Metropolitan Floral Society have been enabled to make arrangements (through the liberality of the Directors of the Alexandra Palace Company) for holding a great autumn exhibition of flowers in Alexandra Park on August 24th and 25th.

— THE collection of dried plants from the banks of Lake Tanganyika, made and sent home by Lieutenant Cameron, is now in the hands of Dr. Hooker. Unfortunately, the specimens were injured on the way down to the coast; but they have been sufficiently preserved to be of use.

— AMONGST the most valuable of imported fruits at this season is the Pomello, which is now abundant in the London markets. It belongs to the Orange tribe, and is, in fact, a smaller kind of Shaddock of peculiarly delicate flavour. It is sometimes called Forbidden Fruit.

— A DINNER-TABLE at the City of London Club, the other evening, seemed to us to be unusually well decorated with flowers, which were combined with gold and silver ornaments with much taste and effect. The brilliancy of the flowers was agreeably toned down with foliage, furnished by such plants as *Dracænas* and Maiden-hair Ferns.

— THE Leeds Professional Gardeners' Benefit Society seems to be in a flourishing condition, judging from its annual report. The income of the society for the past year amounted to £144 18s. 2½d., and the expenditure during the same period was £116 9s. 6½d., leaving a balance of £28 8s. 8d., which brings the funds of the society up to £433 12s. 0½d.

— MESSRS. STUART & SONS, of Dundee, state that rates for railway transit of nursery goods have largely increased since the 1st of January last. Last autumn's rate to London from Dundee for trees was 51s. 8d.; now it is 70s. They, therefore, waited personally upon the goods manager at Dundee, who promised to represent the matter at head-quarters, so that the old rates, which were high enough, may be adopted; and they are of opinion that, if all interested would take the trouble of promptly urging their several goods managers to interest themselves on the subject, the result might be important to the nursery trade.

— IT is only a very short time ago since it was supposed that the origin of the true medicinal Rhubarb of commerce had been finally settled, and was the product of *Rheum officinale*, recently figured in the "Botanical Magazine," and admitted in Flückiger and Hanbury's "Pharmacographia;" and already this comfortable arrangement has been disturbed. In a recent number of Regel's "Gartenflora" there is a figure of *Rheum palmatum* var. *tanguticum*, which is described as the "most genuine amongst genuine" Rhubarbs, and as the sort imported into Siberia by way of Kiachta. It was raised from seed collected by Mr. Przewalsky in south-west China on the high plateau bordering on the high lands of Thibet.

— WE have received from the New Jersey Cranberry Growers' Association some bottles of most excellent Cranberry jam which has an advantage over the majority of English made jams, inasmuch as it is a happy mean between the extremes of sweetness and sourness. With our transatlantic cousins this jam has always been a favourite, and it is eaten under a variety of circumstances, some of which are similar to our own use of Red Currant jelly. The culture of the Cranberry is becoming a very important industry in various states in America. We are slow to adopt novelties of this kind, but in days when preserved American Peaches and Tomatoes are seen in our shops, these excellent Cranberry products cannot long fail to find a market here.

— AT the meeting of the Royal Horticultural Society held on Wednesday last, Messrs. Veitch received a first-class certificate for *Abutilon Darwinii*, a free-flowering species, with fresh green trilobate foliage and bright orange-scarlet axillary flowers. It is likely to be very useful as a winter-blooming stove or warm greenhouse plant. A second-class certificate was awarded to *Odontoglossum Warszewiczii*, a native of Costa Rica, exhibited by Messrs. Veitch for the first time. Its habit is similar to that of *O. vexillarium*, and the flowers, in size and colour, remind one of those of *O. Phalænopsis*. Messrs. Caldwell, of Knutsford, furnished a well-grown plant of *Azalea amœna* Caldwellii, a variety with much larger flowers than those of the type, and evidently a plant which will be valuable for purposes of early decoration.

THE GARDEN IN THE HOUSE.

BALCONY GARDENS IN SPAIN.

SPAIN, though full of natural advantages, is not a country in which gardening has arrived at its highest state of development. In some parts of it leagues may be traversed without a tree being visible, and this in districts, too, where soil and climate are alike favourable to their growth. On the other hand, the Alamedas or public gardens, attached to most Spanish towns, are nearly always beautiful—beautiful from the very wealth of vegetation that too often is allowed to run riot in them. In addition to these public gardens or promenades, which are indispensable in a country in which the rays of the sun are nearly vertical and fall with an almost tropical power, Spanish towns, more especially those in the southern part of the kingdom, have a system of balcony gardening, the greenery in which serves as a relief to the long narrow streets, where the heat, radiating from the whitened houses, is inconceivably intense. Travellers in Spain, for the first time, are captivated with these street gardens, from which all manner of creeping plants depend in graceful profusion over the scorched and dusty walls. These balcony gardens



Spanish Balcony Gardening.

are usually under the especial care of the Spanish señoritas, who certainly manage to infuse into them as much beauty as is possible under such unfavourable circumstances as regards shade and moisture.

F.

HEPATICAS IN BOUQUETS.

WHEN mounted in hand or button-hole bouquets, few flowers obtainable at this season are more effective than the old-fashioned Hepatica, a plant commonly met with in nearly every cottage garden. The large single blue (or perhaps I should rather say lavender) and the double pink kinds, are the most striking. The blue contrasts well with white, yellow, scarlet, and pink, and the pink is most effective when mixed with white and blue. I have seen a handsome hand bouquet formed of white Camellias, Azaleas, Gardenias, Lily of the Valley, scarlet Geraniums, and blue Hepaticas, with the addition of Ferns. One consisting of white flowers of the same varieties as those just enumerated, with pink Hepaticas interspersed through them, had also a fine appearance. In button-hole bouquets, blue Hepaticas against a yellow Rose-bud, such as that of Maréchal Niel, look well; while the pink kind is most effective associated with maize-coloured flowers, such as Roses or Orchids. For hand bouquets, Hepaticas should be mounted on stubs in little bunches of not less than six in each bunch, and bound round their stems with a little wet Moss to

keep them fresh. In button-hole bouquets, they will not require to be mounted, as their natural stems are quite long enough for that purpose. Though the blooms of this pretty spring flower are obtainable, as I have said, in almost every old-fashioned garden, those which have been lifted from the open ground, potted and started in a greenhouse, or cold frame, are the most suitable for bouquet making, the flowers produced under glass being cleaner than those out in the beds. The latter growing, as they do, so close to the ground, are apt to get soiled, especially during heavy rains. The leaves of Hepaticas may often be used in small bouquets, being in form not unlike those of some dwarf Ivy.

A. HASSARD.

THE FLOWER GARDEN.

SUB-TROPICAL PLANTS FOR INDOOR DECORATION.

I CAN fully endorse all that your correspondent, Mr. Groom, has said in favour of these for winter decoration. Plants of fine foliage and stately growth are valuable at any season, to tone down the glare of colour and break up the uniformity and flatness which too often prevail in modern flower gardens. Valuable as they are for the above purposes, they are doubly so for forming bold groups in large conservatories, halls, &c., when other plants, even if available, are too valuable to risk in such places in the winter season. For saloons, corridors, halls, &c., they are much more effective than flowers, as they associate better with the surroundings than any plant in bloom, unless it has ample and bold foliage in addition. Few things are better adapted to this purpose than the old *Cineraria cyba*, the bold handsomely-formed leaves of which are almost equal in texture and appearance to rich velvet. Like all plants with large leaves, it is a gross feeder, and should be liberally treated, to have the foliage really fine for autumn and winter decoration. It is best, therefore, to plant it out in June in deep rich soil; and, by taking it up carefully in the autumn, the rich leaves made during the summer, which will be finer and more attractive than if grown in pots, may be easily preserved. This fine-leaved *Cineraria* is at least half hardy, and will, therefore, stand a good deal of rough usage, cold and draught, such as plants often have to put up with in halls and corridors. *Abutilon mar-moratum* makes a splendid winter plant if grown in a light warm house, as the leaves are much more delicately mottled than they are when grown out-of-doors in the summer. This variety is superior to *Thompsoni*, being more robust in growth, longer in the leaves, and more richly mottled. A bed of this, dotted over with the old *Verbena venosa*, or edged with *Viola Perfection*, is most pleasing and effective. *Aralia Sieboldii* and *Sieboldii variegata* are invaluable for standing in draughty passages or cold conservatories; indeed, their thick leathery leaves and hard woody stem render them almost indifferent to cold or light, as they will stand for weeks without injury where few other plants could exist as many days. Their beautifully cut, polished, bright green leaves are always attractive, and command admiration. The best way of obtaining these is to sow seed at once in gentle heat, and, if potted on and well treated, they soon make nice plants. *Aralia papyrifera* makes a fine stately plant, and is valuable for the centre of beds and groups, but is not equal to *Sieboldii* for hardiness of habit or general usefulness. This variety propagates readily from the roots. Large fleshy pieces of these, cut into lengths of 2 inches or so, and inserted in heat, will soon send up shoots, and form nice plants by bedding-out time. *Melanthus major* is, perhaps, one of the most useful and striking of this class of plants, and the peculiar colour and distinct form of its leaves always render it attractive. For winter decoration I find it one of the most useful, and it has such a distinctness of character that few persons pass it unnoticed. Seed of this, sown in heat now, will make plants fit for planting out in June, and be ready for lifting the following autumn. *Echeveria metallica*, if grown to a good size, makes a fine plant for vases to use in light dry places, or in connection with statuary or architectural embellishments, with which it associates well, and shows off its rigid outlines to great advantage. This, too, soon makes nice plants from seed; if sown in heat now they will make useful plants for next winter. Palms are, perhaps, the most effective of all the fine foliage plants; indeed, they are looked on as aristocrats among plants, and can scarcely be misplaced, as they associate well with other things, and impart an air of grace and lightness unequalled by anything else. Unfortunately, most of these require more warmth for their growth than that afforded by an ordinary greenhouse, and the greater part are of slow growth, and dear compared with other plants. Such varieties as *Latania borbonica*, *Areca lutescens*, *A. Baueri*, *A. sapida*, *Seaforthia elegans*, *Phoenix reclinata*, *P. dactylifera*, *Chamærops humilis*, *C. australis*, and *C. excelsa*, may be had at moderate cost, and all succeed in a greenhouse temperature.

J. S.

CHANGING THE NATURAL FORMS OF PLANTS.

VARIETY in gardening does not consist wholly, as some appear to suppose, in the number of kinds or species of plants obtained and cultivated. Diversity of form obtained by training them will frequently produce almost, if not quite, as beautiful an effect as great variety; herein lies much of what is termed skilful and successful gardening. Suppose, for instance, one has but the two varieties of the dwarf double-flowering Almonds, the white and pink. A clump of each are pretty ornaments to start with, then a change can be made by putting the pink sort in the centre of the group, and a row of white outside, and in such a position that one can look down upon the clump instead of a side view. Then this order may be reversed, or a long ribbon of pink and white may be made by planting a row of each, side by side. A far more elegant shrub is produced by budding these plants upon Peach or Plum stocks, and 4 or 5 feet from the ground. Young healthy sprouts or seedlings should be planted in spring, and the stems cut off at the desired height; and, if there are any side branches, shorten these to within 3 or 4 inches of their base. Young shoots will push, and into these the buds are to be inserted in July or August, or when in proper condition for the operation. A stock may be budded with one variety, or a few buds of the White Almond put on the centre shoots, and a row of pink on the outside. It is always a good plan to put in more buds than are desired, if all should grow, which does not always follow, even when the budding is done by a skilful hand. The white-flowered sort has quite stiff upright growing branches; but those of the pink are long and slender, and, when worked on such stocks as I have described, will bend over most gracefully, especially when loaded with flowers. The elegant appearance of such a shrub can readily be imagined if never seen by anyone who is acquainted with the plants named. Of course, I am presuming that everybody who has a garden knows how to bud and graft trees; and, if they do not, they should learn without unnecessary delay. Perhaps these few hints given will set the reader thinking how other departures from standard types may be secured; if so, everything will depend upon the persistency of the effort in that direction. Many persons, however, are prone to think that it will not answer to depart very widely from the natural "bent" of the plant; therefore, their climbing plants are always treated as climbers—never as bedding or low trailers. A Prairie Rose looks well upon a trellis, or trained to a stake, or when pegged down to the ground to form a rosy cushion only a few inches high. If weeds and Grass are likely to interfere, it is a very easy matter to cover the ground for a few feet about the main stem with gravel, old bark, or anything which will prevent the weeds growing through. All kinds of climbing plants may be treated in the same manner in order to produce a variety of ornaments. Honeysuckles trained over an old rock or heap of stone look fully as well, if not better, than when covering some costly trellis. Wistarias may be trained as low or high shrubs, although they are classed among the climbers. Because a plant naturally grows tall and slender, it does not necessarily follow that its form cannot be modified to suit our convenience or taste in the matter. By lopping off a branch here, and bending another there, natural forms may be changed without seriously interfering with natural laws; and, by a little forethought and consideration as to the effect which we desire to produce, there is little danger of falling far short of the object sought. There are usually more or less waste materials about a place which can be used to advantage in this way. The old Plum sprouts may be used as stocks upon which to work the double-flowering Almonds, Peaches, and Plums. The Cherry and Apple seedlings can also be turned to good account in the same way; in fact, stone-heaps and rubbish-piles, as well as old stumps, may be made useful as well as ornamental.—"Horticulturist."

Fuchsia Riccartoni—According to Mr. Tillery, writing in the "Gardener's Chronicle," Fuchsia Riccartoni came from Port Famine, on the Southern American coast of Terra del Fuego. In the western isles of Scotland, the south of Ireland, and the southern counties of England and Wales, it is hardy, and forms one of the finest flowering hardy shrubs that has been introduced. In a catalogue of indigenous and tropical plants which he has cultivated and kept from 1832 until this date, under the head of Fuchsias are the following old varieties:—Coccinea, introduced from Chili in 1788; lycoides, from Chili in 1796; tenella, from Chili, in 1824; virgata, from Chili, in 1825; excortica, from New Zealand, in 1825; microphylla, from Mexico, in 1828; and fulgens, from Mexico, in 1837. None of the Chili varieties are so hardy as Riccartoni, for if planted out they require covering up in severe frosty weather, even in the south of England. Globosa, conica, gracilis, and other old varieties, which he has likewise grown, are very likely to have been early garden hybrids. The Mexican varieties of Fuchsia—fulgens, serratifolia, and others—are tender, and only fit for greenhouses and conservatories.

THE FRUIT GARDEN.

RUST ON GRAPES.

THIS only affects the appearance of the fruit, without spoiling it for use. When the berries are small they are most liable to rust, but after they are thinned and stoned they are past all danger of rusting, so that no anxiety on that score need be felt when this period has been reached. It is quite perceptible at its earliest stage, and may be recognised by the speckled rough brown marks which appear to a greater or lesser extent on the berries; and these marks never leave them, nor do they change colour; when the fruit is jet black, their brown hue is still perfectly visible. Black varieties are more susceptible of rust than light ones. The Black Hamburgh, one of the most useful of varieties, is the first to become rusted. The disease, it has been alleged, is the result of not washing from the pipes the sulphur used the previous season before starting the Vines. I cannot tell in what way the sulphur effects the mischief, but I am convinced on one point—the fumes have no hand in the affair; and I do not see that sulphur sticking fast to the pipes can reach the fruit in any other way. For my own part I do not believe that sulphur has any influence in producing it, for it is only when the berries are small and tender that they are liable to rust. Now small bunches of Grapes are often allowed to form on the lateral growth of Vines when the main crop is nearly ripe, and when sulphur is needed it is applied about this time, when I have often observed that, although the sulphur fumes were strong enough to kill a strong force of red spider in two nights, the young tender berries on the lateral shoots were not injured in the slightest degree. Cold draughts of air are what I consider as the principal cause of rust on Grapes, for I have often observed that wherever rust appeared it was upon those bunches that were directly opposite a current of cold air, which, if not constantly playing upon these, was at least occasionally admitted. J. M.

Grapes Shanking.—Those who are best acquainted with Grape growing feel least certain what the primary cause of shanking is. Some varieties are more liable to shank than others; even in the case of two Vines of the same kind, planted side by side in a border in which their roots intermingle, one will sometimes shank, while the other remains sound. I have known a house of Vines, at least fifty years old, with stems at the base as thick as one's leg, which produced shanked berries year after year. Draining and protecting the borders were tried, but with no good result; as a last resource, the Vines were cut down, and young rods trained up from the old stock, and not a shanked berry has been seen since. This fact induced me to believe that I had discovered a cure for shanking; and, on being applied to for a remedy in a similar case, I related what the cutting-down plan had effected. It was, therefore, at once resorted to; but, in this case, instead of effecting a cure, the Grapes shanked, if possible worse than before. The disease appears to me to be constitutional; whatever induces healthy vigour undoubtedly tends to keep it in check.—B. W. S.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

The Best Filberts and How they Should be Grown.—The Cosford, the Red and the White Filbert, and the Waterloo, are the sorts I would recommend "E. A. N." (see p. 131) to plant; the last—an excellent sort—is sold possibly in other nurseries under some other name; mine came from the Chilwell Nurseries, near Nottingham. For suitable soil, &c., and mode of cultivation practised in the orchards near Maidstone, in Kent, see "Encyclopædia Britannica," seventh edition, article Horticulture, Vol. XI., page 650.—B. S.

— "E. A. N." will find the following Filberts answer his purpose, viz., the Cosford, a thin-shelled sort, very early and of the finest quality, Lambert's Filbert, and Kentish Cob—the latest and best of all the Nuts, and one which under good preservation will keep good for two years. Filberts will grow in almost any good well-drained soil; the distance between the trees should be 12 feet; height of trees 5 feet, to be kept within limits by pruning; the trees should be kept free from superfluous wood, and all suckers should be carefully eradicated. The trees will be much benefited by receiving a good solid dressing of manure every two years.—R. NISBET, *Aswarby Park*.

— In Kent Filberts are pruned yearly, and kept as bushes on one stem by allowing no suckers to grow at their roots. I have, however, never grown them in that way myself, the plantation here being formed of straggling bushes, which generally bear large crops. The following are the varieties planted out here, viz., Pearson's Dwarf Prolific, which is one of the surest of bearers, and one which ought to be planted plentifully and mixed with the others, as it always produces plenty of catkins; Red, White, and Purple and Cosford Filberts, the Kentish, and Prolific are the best of the Cob-nut section. Some of these sorts can be had grafted on the Spanish Hazel Nut, on stems 3 or 4 feet high. This stock, producing, as it does, few suckers, they can be grown into nice ornamental standards by thinning the most crowded shoots and stopping the vigorous ones. The soil of the Filbert plantation here is of a stiff loamy limestone character, and it was trenched 18 inches deep and some rotten manure put into the bottom of the trench, but no manure has been added since. The trees were planted in rows 10 feet apart and 5 feet asunder in the row, standard Plums being planted in the middle of each row.—WILLIAM TILLERY, *Welbeck*.

THE INDOOR GARDEN.

PLANTING OUT CAMELLIAS.

JUDGING from observation, I think this is the best way of growing these favourite plants. They certainly grow more freely, and are more easily kept in a healthy condition when planted out than when confined to pots, and become larger and handsomer plants. I do not remember seeing a Camellia either in a pot or otherwise which pleased me more than the large specimens in the conservatory at Chiswick House. These prove the benefit to be derived from planting out when old age comes upon them. These plants are of larger dimensions than they could possibly have attained in pots or tubs. Their growth, health, and annual bloom are wonderful. Some years ago I remember seeing some nearly equal to them at Ferguslee, near Paisley. These had been planted out for many years. In character they resembled a luxuriant Portugal Laurel, and they had been often cut back to prevent them from obstructing the pathway. They, however, continued growing, and presented a perpendicular face of foliage, equal to the best-leaved hedge I ever saw. In the flowering season they were a sheet of red, white, and other colours. Another instance came under my notice lately at Drumlanrig. The plants there are more recently planted, but their condition is most satisfactory. As they have not yet grown into each other, and become a single mass, the health and symmetry of every plant is easily observed; no vestige of bare stem was visible; the wood was clothed with healthy green foliage to the main stem. The blooms were furnished in the same luxuriant way, and for size vied with any I have ever seen. Every bush was smothered with gorgeous blooms and buds, and many of the latter had to be thinned off. Some of these plants were forced into bloom in September. In November they were as fresh as ever, scores of the first-opened flowers having been cut. Camellias in general do not force well. I never saw a plant so treated without suffering considerably. At Drumlanrig the plan adopted is very simple. The early flowering plants are out of bloom by January. They are started into growth in February, with something like a stove temperature. This heat is kept up until the young wood is strong and the flower-buds set. The temperature is then lowered by degrees until greenhouse treatment is given them throughout the summer. In October they need little inducement to come into bloom, and well they look at such a time. Camellias might be planted out in every greenhouse and conservatory that has a centre bed; nothing better could be placed in such a position, and I do not consider the fact of not being able to remove them any objection. A well-foliaged bush or clump of them is never offensive to the eye, and, when the side shelves are furnished with small plants, a bold centre is a pleasant relief. In preparing to plant out Camellias, the first matter requiring attention is the drainage. This should be ample, and nothing is better for the purpose than broken bricks. Their depth should be according to that of the bed, but at no time should less than a layer of 2 inches be considered sufficient; for a bed 2 feet deep double the quantity of drainage is not too much. Rough bits of turf or broad sods must be placed next the drainage; this prevents the finer soil from choking it; the remainder of the bed should be filled up with rich, mellow, fibrous chopped turf. If deficient in sand a little may be added. A good quantity of charcoal may be mixed in all kinds of soil. When the bed is filled the soil should not be too wet or too dry, but in much the same state as that generally used for potting. The time to plant is at that period when potting would be done—that is, after the flowering is past, and when growth has begun, but before it is too far advanced. Old plants of large size, but past their prime, may be planted out with advantage, when their vigour is generally renewed. When the roots of such are much matted, they should be disentangled as much as possible. This is an important matter, and is of immense benefit to the plants. The same remarks apply to young open-balled plants. After they are planted, watering should be delayed until the roots have begun to lay hold of the soil; this will be within a fortnight, if all goes well. During this time the house must be kept close, and shaded from strong sunshine, and the atmosphere must be

humid, with a temperature of 65° at night, and 10° more upon hot days. When the growth and flower-buds are matured, air should be gradually admitted, until the top and bottom lights are left continually open; this has the same effect as placing Camellia plants in pots outside to harden their wood. This treatment for encouraging their growth, setting the flower-buds, and ripening their wood becomes an annual practice, and their profuse blooming becomes the same. The old and valuable Double White variety and imbricata are two of the best at Drumlanrig for autumn blooming; but every kind succeeds when planted out. For this, and even other purposes, my favourite kinds are, amongst whites, Candidissima, Alba compacta, Comte de Flandres, Dionisia Poniatowski, Duchesse de Berri, Fimbriata, and Virgine di Colle Beato; reds—Adrien Lebrun, Coquetti, and Reine des Fleurs; rose—Carlotta Nencini, Comte de Thol, Contessa Mariana, Marzo, Exquisita, Corradino, Eugénie de Massena, and Elegans; other pleasing shades—Comtesse Lavinia, Maggi, Jubilee, Countess of Ellesmere, Queen of Beauties, Ninfa del Tebro, and Lady Hume's Blush.

J. MUIR.

A NEW FERNERY.

THE accompanying illustration shows a section of a Fernery erected at Langside, by Messrs. Boyd, of Paisley. Strong brick walls are carried up both sides and at one end, from which the rock-work slopes irregularly down on either side, forming a miniature ravine with a waterfall, the stream meandering round the crags and amongst the



Section of a Fernery.

stately tree Ferns. The entire building is covered by a glass roof, supported by strong iron girders, and the interior—60 feet long by 30 feet wide, and 30 feet high in the centre—is thus left without a single pillar or tie-rod, thus leaving the space wholly to the Ferns and rock-work. The latter was constructed by Mr. Pulham, and is admirably adapted for the purposes to which it is devoted. Messrs. Boyd have erected several Ferneries on this plan and, amongst others, that at Mr. J. C. Wakefield's, at Eastwood Park, the interior of which was fitted up by Mr. Blake. One at Benmore, Argyleshire, is built against a cliff in such a way that one side consists of natural rock, which, being tastefully planted with Ferns, has a fine effect.

WORMS IN POTS.

I LATELY saw a considerable number of plants re-potted, and many of the balls, when turned out of the pots, in which they had been for a long time, were completely perforated with worm-runs. The plants, as might be expected, were in a very unhealthy state, for they cannot grow successfully with worms in the soil in which they are potted. Worms are as great pests as moles in any ground; for, if they do not disturb the roots, they always carry the soil down amongst the drainage, which becomes clogged up. This in itself is sufficient to produce a very bad condition; in fact, the whole ball soon becomes

stiff and sodden with worms working in it. Fibrous loam is quickly reduced to this state by them. A sprinkling of soot spread over the drainage, before putting any soil into the pot, will prevent worms from coming up into the soil for some time; but this gradually loses its power, and does not destroy those which are in the soil when potting takes place. It is, therefore, a good plan to pick the worms from the soil before using it; a little soot mixed with it will effectually get rid of those smaller ones which may have been overlooked. Soot is a valuable fertiliser, and may with advantage be used in soil for nearly every purpose. Care should be taken that the bottoms of pots are never placed in loose soil, or any other free matter through which worms can penetrate, or your preventive measures and trouble will avail you nothing; a firm bottom of coal-ashes is the best substance to set pots on, as it resists all attempts to get through. Gravel has not the same influence, unless laid in the form of concrete. Strawberry plants in pots are often infested with worms. It is next to impossible to keep them out of these; they generally find their way into the small pots when the runners are being rooted in them. A handful of ashes under each pot will prevent their access in a great measure, but runner pots are often plunged in the soil, and they can then get in from either top or bottom. As many as are visible will, of course, be thrown out at the time of shifting, and if any still remain, the application of lime-water is the best method of destroying them. For every gallon of water half a pound of hot lime is needed; the requisite quantities should be mixed up in a tub, and well stirred up when the lime is put in. The mixture should not be used until the liquid is quite clear and the lime sunk to the bottom; each ball should then be thoroughly wetted with it, and if the first application is not effectual, the second always will be. I have seen the holes in the bottoms of the pots stuffed up, the pot filled to the brim with the lime, and allowed to remain thus for an hour. This plan kills the worms, and leaves them in the soil; I prefer leaving the holes open; it saves a great amount of labour, and the worms, when touched with the lime-water, either come to the surface, when they may be gathered, or make their way out by the drainage hole. This method of getting rid of worms is very simple, effective, and may be resorted to without the slightest danger to any kind of plants. J. MUIR.

FOUR VARIETIES OF STREPTOCARPUS.

THERE is now coming into bloom in my cool stove-house a beautiful variety of *Streptocarpus*, which I received from the Botanical Gardens, Glasnevin, where it was believed to be *S. Saundersi*—a mistaken supposition, however, inasmuch as the plant is evidently *S. polyanthus*, figured in the eighty-first volume of the "Botanical Magazine," tab. 4,850, and not *S. Saundersi*, figured in volume eighty-seven of the same work, tab. 5,251. These two varieties of this genus are what are botanically termed *Monophyllous*—that is to say, each plant produces only one leaf, which, in their case, is of great size and substance, often reaching a foot in length, and 8 or 9 inches in breadth, closely adhering to the earth, and hanging down over the side of the pot. From the base or axil of this large leaf rise the flower-scapes, which in strong plants are produced in great abundance, and usually begin to appear about this time of the year, continuing to produce their beautiful flowers for two or three months continuously. The individual blooms of *Streptocarpus polyanthus* resemble a large Violet in shape, are of a clear pure lavender colour, and are produced on tall branching foot-stalks. This species was introduced from Natal in 1853, by Captain Garden, and was raised by the merest chance, some seeds of the plant having fallen among the roots of a living Fern, where they germinated after their arrival in England. The blooms of *S. Saundersi*, which is, perhaps, the most beautiful of the four, are of a delicate greyish-blue colour, with two distinctly marked purple blotches at the opening of the throat. The three plants in one good-sized pot, from one of which the plate in the "Botanical Magazine" was prepared, had then produced no fewer than twenty-one fine spikes of bloom, and over 120 flowers were then in actual perfection. This variety was first flowered in this country by Mr. Wilson Saunders, of Reigate, after whom it is named, and to whom seeds of it were sent from Natal by Mr. Plant. The other varieties of the family as yet introduced are not *Monophyllous*, and are of much less robust habit of growth, and also much less profuse flowering than the two first described. The first of them, *S. Gardeni*, named after the introducer of the fine *S. Polyanthus*, and figured in Vol. 81 of the "Botanical Magazine," tab. 4,862, only produces two pale lilac flowers, faintly streaked with purple on each stem, while the second, *S. Rexii*, figured in the 14th volume of "Edward's Botanical Register," tab. 1,173, seldom, if ever, produces more than a single flower on each stem; its blooms, however, are of a deeper shade of lavender than those of *S. Gardeni*, and are prettily streaked with purple, and they appear continuously from six weeks to

two months; they are also individually larger and more tabular-shaped than either of the large-leaved varieties, and more resemble those of a small *Gloxinia* in their formation. *S. Rexii* will succeed in an ordinary greenhouse, and is the only one of the four commonly met with. I should be glad if any of your readers could put me in the way of obtaining either plants or seed of *S. Saundersi* or *S. Gardeni*, as both are well worth growing, but especially the former. I may add, that I have only once met with *S. Saundersi* in the collection of any nurseryman, and the plant I then obtained, having died without flowering, when I inquired for it again it could no longer be supplied.

Belgrove, Queenstown.

CULTURE OF THE DOUBLE CHINESE PRIMROSE.

IN answer to "Primula" (see p. 146), allow me to say that most of the cultural details regarding Chinese Primroses must necessarily depend upon the time at which it is desirable they should flower, and also upon the various purposes for which they are required. Nevertheless, whether they are intended as specimen plants for conservatory ornamentation during winter, or as small-sized plants for intermixing with others for room decoration, or simply as cut blooms, a purpose for which they are admirably adapted, inasmuch as they keep fresh long after being cut, your correspondent may derive some information from the following cultural remarks. As regards propagation, that may be effected by means of cuttings secured when the plants are in vigorous growth. I would therefore recommend August as the best month in which to strike cuttings of double Primulas, as plants rooted then and kept over the winter without blooming make by far the best specimens the following season. In the first place, have in readiness a close frame, in which there is a bottom-heat of about 75° previous to taking off the cuttings, as any excess of humidity, either in the shape of steam or otherwise, is to be avoided. The cuttings should be taken off with a heel, *i.e.*, with a portion of the firm wood attached to them, and inserted singly in thumb-pots, in a compost consisting of two-thirds peat, and light loam and sand in equal parts; and, if the peat be of a hungry character, a little leaf-soil may be added. Be careful, in inserting the cutting, that a portion of the silver-sand surrounds it; and, at the same time, it will be necessary to support the more vigorous growths by staking them securely, so as to prevent their falling over. Water freely, to settle the soil in the pots; and, after it is drained off and the foliage is dry, plunge them in the frame, which must be kept moderately close; at the same time, guard against damping off, and screen them from a bright sun. They will quickly and surely establish themselves, after which they must by degrees be inured to light and air until they withstand full exposure without flagging. They will then require a shift into larger pots, and must be kept in a mild temperature until established; after which, by degrees, they must be inured to a light airy pit, in which the minimum temperature does not fall below 40°, as it is not desirable to produce robust growth, so long as the plants are kept slowly growing through the winter. Be careful to pinch out the whole of the flowering shoots as they appear. If shifted on during early spring, use a somewhat rougher compost of turfy loam and leaf-soil, with a liberal admixture of sand to ensure perfect porosity. Pot moderately firm upon an efficient drainage. The plants will make rapid progress placed near the glass in a light structure. Large pots are not to be recommended, as, from the delicate nature of the roots, they thrive best when in a compact state, and are, consequently, not so liable to suffer from damp, for they quickly succumb in a soil that is at all sodden; water, therefore, should at all times be carefully administered to the roots, and 6, 7, or 8-inch pots will be sufficiently large; the latter size should be used for the strongest plants only, which are intended for conservatory adornment. As Primulas naturally delight in a somewhat shady position—that is, screened from the mid-day sun—the best situation that can be chosen for them during the summer months is a frame under shelter of a wall facing the north. The plants should be placed upon ashes, of a sufficient depth to prevent the ingress of worms, as well as to facilitate perfect drainage under the pots. Shade them from bright sunshine, and encourage vigorous growth by syringing round the sides of the frame and amongst the plants, but do not syringe the foliage, and gradually inure them to a free circulation of air, which is most desirable for promoting sturdy growth; at the same time sweeping currents of air must be avoided, as they are particularly damaging to this class of plants. Treated thus, they will make fine plants by September, when they should be removed to an airy pit, and kept close to the glass. Hitherto the flowers having been removed, an early batch should be selected, and allowed to produce bloom, which they will do in great profusion. As the double varieties are, upon the whole, more floriferous than the single, and last a longer time in flower, they should, under favour-

able circumstances, stand in good condition for at least four months. When the plants are in flower, they should be placed in a light airy position near the glass, and be subjected, if possible, to a temperature averaging 45° . Without this treatment perfect success is not to be looked for; in a light airy house only, will they produce, in full vigour, those elegant masses of blossom for which this class of plant is so highly prized. Larger plants than those I have referred to may be grown by potting on those best formed for the future season; but these rarely turn out satisfactorily, and, being very liable to damp off, are certainly not worthy of the trouble necessary to ensure even partial success. When a large quantity of plants are requisite in 4 and 5-inch pots, for furnishing trays in rooms, a portion of the stock should be propagated in spring. After the plants have finished flowering, remove the flower stems and slightly reduce the foliage; afterwards encourage fresh growth in a genial temperature for a few weeks previous to taking off the cuttings; they will then root freely in a brisk bottom-heat. If attended to as previously recommended, they will soon make strong plants, and by October, when they are placed in a growing temperature, they will have developed an abundance of flower. For the smallest-sized plants spring propagation may be resorted to; at the same time Autumn is the most favourable season for preparing for a successful start with this easily cultivated, but somewhat overlooked, class of flowers.

GEO. WESTLAND.

THE CONICAL-BERRIED SOLANUM.

(*SOLANUM CAPSICASTRUM*.)

THIS is one of our most ornamental indoor berry-bearing plants, and one which is grown by the thousand for the supply of Covent Garden market during the autumn and winter months. There are several varieties or strains of this species in cultivation, differing from one another in size, berry, dwarfness of habit, and in the profusion, or otherwise, in which the fruit is produced; and now, we believe for the first time, we may add, in the form of the berries. In our illustration, as will be seen, they are oblong or conical, and, in this respect, differ from those of any other variety with which we are acquainted. We recently saw a plant of this variety a foot high, and about the same in diameter, in the Wellington Road Nursery, profusely covered with berries, the colour of which was orange of the most brilliant description.

It was one of a batch raised from seed sown in March, 1874. The seedlings were potted on, and, about the last week in May, they were planted out on a western border. Here they received no attention, except occasional waterings until the autumn, when, just before the berries commenced to colour, they were carefully lifted, and potted in 32-sized pots. They soon formed new roots, having been kept in a close atmosphere for a few days after lifting, and when we saw the plant, from a portion of which the accompanying illustration was prepared, at Christmas last, it was loaded with berries, handsome both in shape and colour. We have no doubt that this variety of *Solanum Capsicastrum*, when better known, will become a valuable ornamental plant.

B.

Echeveria fulgens.—This ought to be better known and more extensively grown than it is, as it is one of the most useful plants for the winter decoration of the conservatory or for cutting from, continuing, as it does, long in flower at a time. It may be induced to flower any time from November to May. When wanted early, it may

be brought on in a warm pit or stove, then hardened off and taken to the conservatory, or it may be kept in a cold greenhouse all the winter, when it will flower in March. The principal thing is to keep it from damping off through the winter. When in a greenhouse it is easily managed. In order to have small useful plants, secure the cuttings of it from old plants that have been brought into flower, say in February. After making the cuttings expose them to the air for a day or so to dry the heel a little, then put them into pots in a good open soil, with plenty of sand in it, plunge them in a bottom-heat of 85° or 90° , and under a good top-heat they will strike in a short time, when they should be potted off into small 60-sized pots, using two parts loam, one part leaf mould, and one part rotten dung, with sand enough to keep all open and porous. Replace them again in heat till established, then harden them off and put them in a cold pit; when well rooted pot them off into 32 or 24-sized pots, using the soil just mentioned. Put them into the pit again until they have become established, when they should be plunged out of doors in an open place, as by this time there will be no fear of frost. During summer

they must be kept well watered, and in autumn they should be brought into a cold house and introduced into heat as required. If the old plants are potted, say in May, they make good specimens, which should be treated the same as the young ones after the second potting. When grown in 48-sized pots, these plants will be found useful for small stands, and I ought to add that they are much benefited by being watered with manure-water when coming into flower.—JNO. CROOK.

Scented-leaf Geraniums.—While Zonal, Bicolor, and Tricolor Geraniums are such favourites (says "Moore's Rural"), it is to be feared that some of the good sorts in other classes are being overlooked. When it comes to making up a bouquet in winter, a few leaves of the sweet-scented sorts work in very agreeably, especially the Rose, Lemon, and Pennyroyal. In addition to the fragrance of the leaves they are also quite showy when well grown. For instance, Lady Plymouth is a variety of the common Rose Geranium, with the leaves distinctly variegated with white, the contrast in colour being so decided that it could scarcely fail to attract attention. Then there is Apple-scented, Balm-scented, Citron, Nutmeg, Peppermint, Orange Myrrh, and (perhaps the grandest of all in appearance, at least) the Fern-leaved. This is a splendid plant, with the leaves so finely cut that they appear more like a mass of green silken

fringe than veritable leaves. The plant is a strong vigorous grower, but not coarse and straggling, like the old Rose Geranium.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Tacsonia Van-Volxemii Culture (Devon).—Merely thin out the long and bare shoots, leaving the shortest and strongest, especially those springing from the stem. Leave a good number of shoots for training-in, and what you do prune cut to within a joint of the place where they originate. See that the plant is not impoverished at the root, and allow it to luxuriate in turfy loam.

Plumbago rosea for Conservatory Decoration in Winter.—This old occupant of our stoves—now rarely met with—possesses a value as a winter-flowering plant that is worth being more generally known. When at Brocklesby Park a few weeks ago, I was surprised to see a number of plants of about 18 inches high, each with four or five spikes of flowers, employed to assist in decorating the conservatory; and on going through the plant-houses I found fifty or a hundred as a reserve stock, ready to take their places. Its flowers are produced in axillary spikes, and have a colour between rose and scarlet. They are cultivated exactly in the same way as the Poinsettia and Thyracanthus, and as winter-flowering plants have a value that agreeably astonished me.—J. C. NIVEN, *Botanic Gardens, Hull*.



A Conical-berried Solanum.

THE KITCHEN GARDEN.

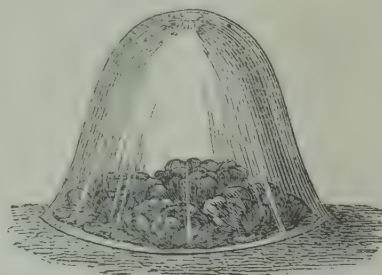
SALAD GROWING UNDER CLOCHES, &c.

THERE is one particular department in gardening in which English gardeners are behind the French; I mean in the production of salads, and more especially during the winter season. There are several things that have assisted in causing this state of affairs. In the first place we are not such a salad-eating people as the French, although the demand for this kind of garden produce in this country has been, and is, continually on the increase; secondly, although our climate may not show a much lower temperature in winter, the more frequent changes from frost to thaw to which we are subject, and the much more humid state of the atmosphere in this country, are conditions so trying to vegetable life, that the growth of good salad plants is more difficult with us; lastly, the appliances generally in use in this country for growing winter salad plants are such as to prevent us producing them in the high perfection that elsewhere can be attained. Again, in France there are many plants used for salads that with us are not generally liked—for instance, blanched Chicory, which on the Continent is so largely used, finds little favour in England, few liking its flavour. In addition to Celery, Beet, and similar plants which are to be found through the season in any well-managed garden, our salads may in a great measure be said to consist of Lettuce and Endive, with Mustard and Cress; in fact, Lettuce and Endive are essentials for a salad, and it is in the production of the different varieties of these that we are behind our Continental neighbours. It is the use of the cloche that enables them to produce in such excellence their salad plants. The moment I saw the healthy comfortable appearance of the plants under these glasses I recognised their great superiority over any other contrivance of the same nature. Even the useful old hand-light, when made of iron, and constructed on the best principle, with a moveable top, is much inferior in one important respect, viz., the deficiency of the light it admits as compared with the cloche, which, when made of good clear glass, enables the plants under it to receive as much light as if they were fully exposed to the open air. Anyone who has seen Lettuce and Endive grown under them cannot fail to have noticed how much sturdier in growth the plants are than those grown in frames. This is owing to the uninterrupted light they receive in every direction. The importance of light to most cultivated plants is admitted on all hands, yet we do not appear to realise the necessity of affording plants grown under glass coverings the greatest amount possible of this life-giving element, which to plants composed of soft, watery tissues, such as those under consideration, is even more necessary to enable them to withstand the incessant fluctuations of our variable climate than it is to those kept out of the reach of frost or damp. Several contrivances have made their appearance besides the ordinary garden frame, in the shape of small frames, some with earthenware sides and ends, made to take to pieces easily, and with glass to cover them in; others are made of wood; but the common fault of all these is that they only give light from above, whereas the cloche admits it all round. Light is the great compensator for the deficiency of air, which plants cultivated under glass must of necessity be subject to; and for such plants as can be grown under it the cloche has no equal, admitting as it does a full volume of light, and enabling salad plants, which the French gardeners grow under them, to thrive with the comparatively small amount of air they receive throughout the winter. To grow these plants well they require something more than the mere care that will suffice to keep them alive. There must be constant attention to produce salad materials in good condition every day in the year, especially through the winter months. One objection raised against the cloche is their liability to break; but surely this is anything but a reasonable objection, for it might be raised more or less against all the light-admitting appliances that gardeners have to deal with. If reasonable care be used there need be no serious amount of breakage.

Lettuce

being the principal article in a salad, either summer or winter, it becomes a matter for consideration how to produce them in the best condition, and also how to procure them, without interruption, all the year round. We will suppose that there is at the commencement of the year a good quantity of Black Seeded Bath Cos and Hammer-smith Hardy Green Lettuce planted in cloches, frames, and under the shelter of south walls, for spring use. Those under cover must have air in abundance on all favourable occasions, especially such as are in the ordinary frames, for they will be much more disposed to draw up weakly than those in the cloches; all must be protected with litter in severe frost, but, the winter past, they must be exposed to the open air. There should also be a good supply of autumn-sown London or some other favourite form of Cos Lettuce, in a tightly-glazed, dry, snug frame, well raised at the back so as to prevent drip

the soil filled in to within 8 or 10 inches of the glass, and dry on the surface, to avoid damping or injury from the effects of being slightly frozen should frost reach the plants. They should stand a couple of inches apart, and will require plenty of air on all days when it does not freeze. To avoid any chance of damage from this source enough litter must be provided to cover the sides of the frame and lights, over which mats should be placed and secured, so that they will not be disturbed by the wind. During the mild clear days which we frequently get through the winter the lights should be altogether taken off to keep the plants stout and dwarf, the object being not to promote growth, but to have them in as hardy a state as possible at the time of planting out. In order to secure this condition care must be taken that when the lights are thus temporarily taken off the plants are not caught by showers, neither must water be given until the time of turning out approaches. About the first week in February make a sowing of the Cos Lettuce in boxes, in a little heat, and also of Tom Thumb or Tennis Ball, keeping the plants, as soon as they are up, as close to the glass as possible, with air every day. So soon as they are big enough to handle they should be pricked out in rich soil, 3 inches apart, in large boxes, and when well established removed to a cold pit, where they can receive plenty of light and air, so as to harden them; make another sowing a fortnight later, to take the place of these should any untoward mishap occur to the previous sowing; treat them in all respects similarly. These winter-sown plants are to succeed the frame autumn-sown ones. By the middle of March a slight sowing should be made in a cold frame or under a couple of hand-lights, treating them when up so as to promote a hardy condition of growth; towards the end of the month a sowing should be made in the open air in a sheltered place. A piece of dry highly-manured ground should be now prepared, such as has been cropped with Celery, which is an excellent preparatory crop for Lettuce. The last week in the month a portion of the autumn-sown frame plants should be planted out on the prepared ground, but do not risk the whole of them, as sometimes these early turned-out plants get cut off. A portion of the



Cloche, with ventilating aperture at top.

first lot of indoor-sown winter plants should also be planted out in ground similarly prepared, especially the small Tom Thumb variety, as, if it succeeds, it will come in quicker than the Cos, and will frequently fill up the gap that might occur between the hardy varieties that have been in cloches or frames, and in the open air. The first week in April plant out another lot, and some more by the middle of the month; in the last week sow in the open air both Summer Cos and Tom Thumb, and plant out some of those sown in the cold frame or under handlights, which by this time should be ready. The outside winter plants will, through this month and the next, be ready for use; and from this time until winter the matter of supply is simple enough if two or three things be observed—to sow once a fortnight in well-prepared highly-manured ground; from this time through the summer always sowing in rows where the plants are to be grown, thinning them out as required, but never putting trust in such as have been transplanted, which are much more liable to run to seed than those sown where they are to remain. If the rows are sown in shallow trenches that will admit of their being thoroughly soaked with water in dry weather, it will be found the best means of supplying them with the large quantities they must have to grow them crisp, and prevent their running to seed. The repeated winter and early spring sowings under the protection advised may appear more than required, and so they may turn out to be in a season when all succeed; but to secure a continuous crop of Lettuce, it is necessary to provide for failures. In most places the Cos varieties are preferred to any of the Cabbage kinds, consequently during the summer season the sowing may be confined to the former sorts; but it is not a bad plan to make a small sowing once in three weeks of the Neapolitan, or some similar Cabbage variety, which will frequently fill up a gap. The best Cos Lettuce that I have found to come into use from the middle of July through August and September is William's Alexandra; it is closer and stands longer before running to seed than any other I have tried. About the beginning of August sow a little Tom Thumb and green Hammer-smith, and repeat the operation every three weeks until the end of October; sow also some Cos, and keep the earliest planted out for autumn use for the open ground, or, where there is danger of frost, for removal into frames, where they can be protected. At this season the Tom Thumb sort comes in well, occupying little room, and consequently admitting of being planted closely, as it is firm and crisp. In October the winter frame should again be got ready, as in the

previous autumn, and sown. If a little seed be put in twice during the month, it will be all the more certain of avoiding any blanks; it is the sowings in the open ground that must be depended upon for the late winter and earliest spring supply, and it is for these that the cloche is so superior to any other appliance for wintering them in. They should be placed close together in rows, with space to walk between, and litter at hand to cover them up in severe weather. In the autumn season, as well as in the early spring, there is nothing like making sowings enough to secure an uninterrupted supply.

Endive.

Both the green-curved and the Batavian variety stand next the Lettuce in importance for autumn and winter salads; but, grown as well as it is possible to grow them, they are much inferior to well-grown crisp Lettuce, except as regards appearance, which, in the curled varieties, is very fine. If seeds of the green-curved and broad-leaved Batavian varieties are put in at the beginning of July, and three other sowings of each sort are made at intervals of three weeks, they will furnish a sufficient supply. As soon as the plants of the first sowing are large enough to handle, they should be planted out in well-prepared soil a foot asunder each way; and the second and third sowings treated in like manner, the last sowing being planted closer, where they can be protected with frames when required, and some planted so as to be covered with cloches, which, as a means of protection for these late plants, are unequalled. As winter approaches, the plants of the second and third sowings, which will be large enough for use, should be taken up and planted in cold frames as close as possible without overcrowding, and here they can be blanched as required.

Mustard, Cress, and Radishes.

Mustard, although not required in such quantity for salads as Lettuce and Endive, is still very useful, especially in the winter and early spring. Its cultivation is so simple and well known as not to require further notice than to say that at all times of the year it should have a rich soil, which not only grows it much crisper, but less hot and pungent. In the winter, in forcing, the soil should be changed in the boxes every time fresh seed is sown. Cress is not so much in request as Mustard, but some people like the flavour of a little. It is not so easily grown as Mustard, but requires similar treatment; the plain-leaved is the best. Radishes are indispensable through a great portion of the year. These should be sown out-of-doors in sheltered situations at the close of the year in dry well-manured soil, the seed being covered with litter, which is allowed to remain on until the seed has vegetated, when it must be taken off every mild day and replaced in the evening. As soon as the first sowings appear above ground make a second, treating it similarly; the third sowing will possibly not require covering with litter. These earliest sowings should consist of any of the long early kinds, and may be followed by the scarlet and white olive-shaped varieties, which, when the seed can be had true, are far superior to either the Turnip or the long varieties—that is, when they are well grown in rich soil, with sufficient room to prevent their being drawn, and with plenty of water in dry weather, so as to bring them on as quickly as possible—for this is the principal point in the cultivation of a good and tender Radish. To have them in good order they must be sown every ten days through the summer, and in hot weather the seed will require plenty of water to make it vegetate. At the commencement of the year a sowing should be made on a slight hotbed. The frame, unless a very shallow one, should be filled up inside with the fermenting materials to within a foot of the glass; on this should be put 6 inches of soil, in which sow the seed. It is necessary to keep them thus near the glass, because, if severe weather should follow when they are up, enough air cannot be given to prevent drawing, which spoils them. To avoid this, they must be thinned whilst small, so as to allow them sufficient room; a successional sowing in frames should be made every three weeks, until the middle of March, after which the outside crops will come in. To succeed the outdoor sowing in the autumn it will again be necessary to resort to frame culture, sowing every month from the middle of September to December; for these early and late sowings, either in frames or the open air, the olive varieties are little inferior to the short-topped long-rooted kinds. My own practice has been to mix the seed, and sow both together. Where there is no convenience for growing Watercresses, the American or land Cress will be found useful in the spring, making a couple of sowings the first and third weeks in September, and putting the seed in a dry warm border in rows a foot apart, with a little Corn salad, which may be similarly treated as to soil, situation, and distance apart.

Beet and Celery.

Beet, which adds so much to the appearance of a salad, as well as in reality being one of the most wholesome vegetables that can be eaten, can, without much difficulty, be had all the year round where

a good cool root shed is at command, for in such a place last year's roots will keep almost until the new crop is large enough to use; but a good variety, possessing a dark colour in the root, should be selected. Many of the vaunted new kinds have the colour in the wrong place, *i. e.*, the leaves instead of the roots. A large growing sort should never be used. A salad should not be considered complete, from the beginning of September until the end of March, without Celery; but to have this dependence must not be placed on most of the coarse hollow varieties so generally met with; one or two really good sorts are sufficient to furnish a supply for the above period. It may be had much earlier if desired, but it is then more a name than a reality, not being either required or worth the trouble when there is plenty of other things in season. For the last fifteen years I have only used one kind, a pink sort, sowing in a little heat the first and last week in February, and, as soon as the plants are large enough, pricking them out in cold frames 4 inches apart in good rich soil 4 inches thick, on a hard bottom of ashes, and planting out for the earliest the last week in May in double rows, a foot apart each way, in well-prepared 3-foot wide trenches, with 5 feet of space between each trench. The plants required for winter and spring may stand in the bed where they are first pricked out until the end of June (and never allowed to suffer for want of water), when they are planted out in single rows, and not earthed up until there is danger of frost, from which it is protected through the winter. The whole is thoroughly soaked with water once a week in dry weather; and for many years I have never had it run in the least before the commencement of April. Immense quantities of worthless Celery seed is sold—hollow, stringy, strong-flavoured, and not worth cultivation. A great deal of error exists as to heavy manuring and high culture having an influence in causing a hollow growth. Nothing can be more erroneous; if the variety be right, and it be grown in rich soil, and plentifully supplied with water, there need be no apprehension of its not being solid, crisp, and well flavoured. If Celery be sown at the time above-mentioned, and treated as described, and it is found that it will not keep until April, the kind is not good; of course, I am now speaking of pink or red varieties, which are, as is well known, better keepers than the white. The method of cultivation described, and the varieties of plants above enumerated, are such as I have for a number of years employed to furnish a salad for every day in the year. It requires forethought, care and attention, if the materials are to be produced without interruption, and in a condition to deserve the name of salad. English gardeners are frequently reminded that they are behind the French in the cultivation of salads; but those who indulge in the taunt should recollect that a gardener, in even a small-sized place in England, has often an inadequate supply of labour, and has his attention unavoidably divided by a dozen things for every one the French grower has to cultivate. There is no plant so easily managed, or that will go so far in assisting to make up for a deficiency of Lettuce or Endive, as Chicory, for a family that will use it. It is of the easiest growth; the seed is sown in rows in May, thinned out to 8 or 10 inches apart, simply kept clear from weeds, taken up in the autumn, and placed in the root-shed, covered with soil or ashes in the usual way; and, when required, placed in pots or boxes, and brought on in the dark, similarly to Seakale. It is easily forced, and has a very fine appearance. Tarragon, Sorrel, Onions, and Chives are also by some used more or less in salads, and they are also employed in small quantities for flavouring. T. BAINES.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Sulham Prize Pink Celery.—I quite agree with Mr. Gilbert respecting the merits of this Celery, and have no hesitation in pronouncing it the best pink variety in cultivation. I have about 800 heads of it still to lift. I find it particularly sound, crisp, and in flavour all that can be desired.—E. BENNETT, Hatfield.

Drain Gratings for Gravel Walks.—I would advise your correspondent, "S" (see p. 146), to have his grids or gratings for taking the surface water from his walks made in the same way as those we have in use here. I always had an objection to stone or wood frames to gratings, showing themselves as without them in a very simple and efficient way, by combining an iron frame they do, conspicuously along the sides of walks, and have contrived to do with the grating, and having the bars rivetted in, if of wrought iron, or cast with the frame, if cast iron is used. The wrought frame is made of common bar iron, 2 inches or so wide and a quarter of an inch thick; and in this the bars are rivetted level with the edge. By placing these on the top of the bricks, which form the cesspools or eyes, the gravel lays close up to the iron frame, and as this is only about 4½ by 5 inches, it is scarcely observed. The 2 inches deep of gravel surrounding the iron frame keeps all firm and immovable. In laying the bricks for the cesspool, care must, of course, be taken to have the inside just a trifle smaller than the frame, or so that the inside of the cesspool corresponds in size with the inside of the frame, and, when laid, the top of the grating should be slightly lower than the surface of the gravel, so as to admit the water freely. Gratings of this kind, if required in quantity, can be had at a cheap rate if cast, and, as they require no wood or stone frames, they cost less and are much neater than those furnished with such appendages.—J. SHEPPARD, Woolverstone Park, Ipswich.

THE GARDEN FLORA.

THE SNOWFLAKES.

(LEUCOJUM.)

THERE is—as, indeed, there ought to be—a tolerably close relationship between Snowflakes and Snowdrops. With the latter we are more familiar in cultivation than with the former, although it is said to be naturalised in one locality in the south of England. As will be seen by the illustration, the aspect of the *Leucojum* is so similar to that of the Snowdrop, that it might be taken for a larger form of it. Those, however, who are accustomed to observe, will readily detect distinctive characters; first, we have the dark green of the leaf altogether devoid of the glaucous hue; broader than even the Crimean Snowdrop, shorter and much more rigid; then, besides the broad campanulate shape of the flower, we have blotches near the tip of the petals, at first yellow, then shading off to green as they reach maturity—a peculiarity not to be found in the Snowdrop; added to these two distinctive characteristics, the Snowflake is scented, hence, possibly, we may trace the origin of the name given to it by our old herbalists, to whom it was always known as “the bulbous white Violet” a term, indeed, embodied in its generic title, which literally means white Violet. The spring Snowflake blossoms about the middle of March—or fully a month behind the Snowdrop—its flowers are produced singly on stems about 6 inches high, it is quite as hardy as the Snowdrop, and grows



Spring Snowflake.



Summer Snowflake.

freely in any ordinary garden soil—these important qualifications, supplemented by its intrinsic beauty, which a glance at the accompanying illustration will at once confirm, render this a most desirable plant, and one worthy of much more extended culture than it at present enjoys. It is a native of Germany, and is, in fact, pretty well distributed through Southern Europe, where it is found in moist upland meadows and woods. There is a variety known by the title of *carpathicum*, which, to my mind, is sufficiently distinct to rank as a species; its bulb is twice the size of our plant, its stature considerably greater, and it frequently produces its flowers in pairs. As the name indicates, this variety or species is a native of the Carpathian Mountains, and it is rare in cultivation. A double variety is also recorded under the title of *L. vernum, multiplex*—this, however, I have never yet seen. Our plate is taken from Wooster's “Alpine Plants,” published by Messrs. Bell & Daldy.

L. *aestivum*.—The Summer Snowflake is not only an old and valued garden plant, but is really a native of this country, though by no means very generally distributed; it occurs in several widely distant localities. I have myself found it growing somewhat abundantly in the Berkshire portion of the Valley of the Thames. As compared with its vernal ally, it is three times its height, as regards both foliage and flower-stems. The flowers are, however, very much smaller, and produced in groups of three or four; in shape they are less campanulate, and, in fact, so like the Snowdrop itself, that were it not for the difference in growth they might readily be mistaken for such, and a very pretty link they make, by

which early spring associations are prolonged into summer. It blooms in the latter end of May or early in June, is amenable to almost any soil and situation, and hence should have a place in every garden.

L. *pulchellum* has been considered by some as an intermediate form between the Carpathian and the Summer Snowflakes; it has, I think, full claim to be considered a distinct species; its leaves and flower-scapes attain a height of 12 to 14 inches, differing from the last chiefly in the greater breadth of leaf, the blunter point, and the more campanulate flower with the greenish-yellow blotch more distinctly defined. It is a native of moist ground in the South of Europe, and comes into bloom fully a month before the former species. Besides these—which may be said to include all the species at present in cultivation that, strictly speaking, come under the generic title *Leucojum*, as now recognised by botanists—we have a little group of exceedingly interesting plants, formerly *Leucojums*, but now constituted a genus by themselves under the title of *Acis*. These consist of the several species, *A. autumnalis*, *A. roseus*, *A. trichophyllus*, and *A. grandiflorus*. They all have slender exserted styles, very narrow leaves, scarcely attaining a height of 4 or 5 inches; pretty white or rosy drooping flowers, sometimes produced before the leaves are developed, and are natives of Southern Spain, Corsica, and North Africa. They are all more or less delicate; by this I do not mean absolutely tender, but rather that they require careful culture, and will only thrive in a light sandy or peaty soil. As a rule, they have a decided objection to pot culture, and will be found more at home in an undisturbed sunny corner of a rockery, where the previous provision of suitable soil has been made beforehand.

JAS. C. NIVEN.

Hull Botanic Gardens.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Herb Beds.—The space allotted to herbs in a well regulated garden is not the least important part; yet it often happens that these necessary plants are met with in a condition that might lead us to suppose that they are left, unaided, to struggle with the weeds for an existence. In selecting ground for the cultivation of these plants, choose a place that is totally free from Couch Grass, Bindweed, or anything of a deep-rooting nature that cannot be removed without deeply stirring the ground. If care in this respect be not taken, it will be found that, however carefully the ground is forked over before planting, some of the roots will escape notice, and be a source of continual annoyance. Select the most convenient spot for access, for something will be wanted from it almost every day; and, if situated in an out-of-the-way corner, the labour of gathering is much increased. The space required by herbs varies very much, but, in most cases, it is small. It is well, however, to be on the right side, and have enough. Mint is wanted more generally than most herbs, and sufficient should be grown to supply all demands from the open ground through the spring and summer, and to furnish a stock for forcing in boxes in winter. If well managed, 10 or 12 square yards will grow a good deal. In preparing the ground, which should be open, and not too heavy, dig in 3 inches of manure, unless it has been well enriched for former crops, in which case half that quantity will suffice; for this, as for all other crops, thoroughly pulverise the soil in digging, not turning it over in thick spits, and merely breaking the surface smooth, whilst the under portion is left in great lumps that are not in a condition for the roots of any vegetable to penetrate freely. When the space is dug, and if the ground is in a sufficiently dry state, remove 2 inches of soil from the surface to the alleys; then, with a fork, move from the old bed, which we will suppose is in existence, a sufficient quantity of roots to plant the new ground. If the ground already occupied is thickly crowded with roots, there will be enough in each square yard to plant three of the new. Place these evenly over the surface, and then cover with the soil that was removed, not treading upon the ground, after it is dug at this early season, more than is necessary, for, if compressed with the feet whilst wet, no crop will succeed well. To enable the amateur to put in his crops without thus treading down the ground, a few deal boards will be of the greatest use in planting Potatoes, Peas, Beans, Cabbages, or anything that is grown in rows, the edge of the boards answering instead of a line, and being equal to it in every way. These boards should be an inch in thickness, 10 or 11 inches wide, and about 12 feet in length. If longer than this, they will not be so handy to move about. Spruce is the best, not being so liable to split as Pine; and, as an additional guard against



LEUCOJUM VERNUM.

splitting, thin battens, 3 inches wide, may be nailed across the ends. It will be as well to leave a portion of the old Mint bed standing until the autumn, as the newly-planted material will not bear so much or so early the first year. When the season is over, the old roots can be taken up for forcing during the ensuing winter. Pot Majoram should be planted in rows a foot apart each way, leaving the crowns just level with the surface of the soil, the plants being made from division of the old plants. Tarragon requires similar treatment. Sage is best increased by cuttings formed of good-sized pieces of the branches, inserted about 6 inches deep in the ground, in April or September, and, if any such exist, they may be planted a foot apart in the rows and 15 inches between the rows. Thyme plants that were raised from seed sown last spring may now be planted a foot apart each way. Lemon Thyme may be increased by division of the roots; Sweet Marjoram, Basil, and Savory are raised from seed sown later in the spring. These are the principal herbs required, and the main thing to be observed in their future culture, so as to make the herb ground productive and tidy in appearance, is never to allow weeds to remain in it so as to seed and interfere with the growth of the plants, and not to let any herbs stand until they become too old, but to put in cuttings in time to replace them before they become useless. A blank in the supply is thus avoided.

Peas, Broad Beans, and Radishes.—In parts of the country where the soil is cold, and where it is useless to sow even the first crops of Peas, Broad Beans, and Radishes at the commencement of the year, seeds of these should now be put in. In sowing Peas in such land, especially if in a garden comparatively new, where nothing has been added to the natural soil to lighten it, they should be sown a little below the surface, doing no more than levelling where the rows are to be, and covering the seed with 3 inches of light open soil, half of which may consist of decayed vegetable matter from the refuse heap. When this is used, however, care must be taken that sufficient lime has been added to kill the slugs, or they will destroy the crop. These Peas will succeed those sown under glass at the close of last month. Beans, in similar land, may be planted a couple of inches deep; for Radishes the surface should be raked so as to level it, and the seed covered with half an inch of sifted soil.

Shrubberies.—In the shrubbery and its surroundings the state and position of deciduous trees should be inspected, especially those planted near the boundary with a view to give shelter or privacy. It is a matter of frequent occurrence to find such trees planted without the slightest regard to the space they will ultimately occupy, and merely placed so as to give immediate effect. Even where the trees have been planted with a due regard to their future proportions, and the intervening spaces filled with others to act as nurses for those intended to be permanent, there is nothing so common as to see the nurse plants retained until they have completely ruined the trees by crowding. The whole of the under branches, which were intended to act as a break, and upon the vigorous presence of which the beauty of the trees depended, are completely destroyed. The object of these nurse trees is only to afford the necessary shelter to those intended to stand, and to assist in filling up the intervening spaces. These temporarily planted trees should, the moment they interfere with the well-being of the others, be either removed altogether, or cut in with no sparing hand. It is often considered time enough to do this when the branches touch; but this is a mistake, for, when they have grown to this condition, very serious harm will have occurred to the permanent trees from the exclusion of light and air, thus making them draw up weakly, and rendering them unable to develop their proper growth. Thousands of amateurs' gardens throughout the country suffer in this way. The present is a good time for reducing the branches, unless the trees are still of a size to be removed, and it is the intention to replant them; in which case no time must be lost, as the buds of many will soon begin to swell.

Natural Beauty.—All our moral feelings are so interwoven with our intellectual powers, that we cannot affect the one without in some degree addressing the other; and, in all high ideas of beauty, it is more than probable that much of the pleasure depends on delicate and untraceable perceptions of fitness, propriety, and relation, which are purely intellectual, and through which we arrive at our noblest ideas of what is commonly and rightly called intellectual beauty. Ideas of beauty are among the noblest which can be presented to the mind, invariably exalting and purifying it according to their degree. And it would appear that we are intended by the Deity to be constantly under their influence, because there is not one single object in Nature which is not capable of conveying them, and which, to the rightly-perceiving mind, does not present an incalculably greater number of beautiful than of deformed parts.—
RUSKIN.

THE NATURAL HISTORY OF THE NEW VINE PEST.

By C. V. RILEY, State Entomologist, Missouri.

[THE accounts of this pest hitherto published have been so numerous and at the same time so imperfect, that we gladly publish the following exhaustive article on the subject, which has been specially revised and corrected by the author for THE GARDEN.]

The first published reference to this insect was made in the year 1856, by Dr. Asa Fitch, the State Entomologist of New York, who subsequently described the gall-inhabiting type of it (which I have termed *gallicola* in a rather insufficient manner) by the name of *Pemphigus vitifoliae*. Dr. Fitch knew very little of the insect, as we understand it to-day. It was subsequently treated of by several American authors, and in January, 1867, Dr. Henry Shimer, of Mount Carroll, Ill., proposed for it a new family (*Daktylosphaeridae*), which has not been accepted by homopterists, for the reason that it was founded on characters of no family value. All these authors referred to the leaf-louse described by Dr. Fitch, and never dreamed that the insect existed in another type on the roots. During the few years following our civil war, a serious disease of the Grape Vine began to attract attention in France, and soon caused so much alarm that the Minister of Agriculture and Commerce in that country offered a prize of 20,000 francs for an effectual and practical remedy; and a special committee was appointed to draw up a programme of conditions, and award the prize if it saw fit so to do. The disease was at first designated as *pourridie*, or rotting, the roots becoming swollen and bloated, and finally wasting away. There were no end of surmises and theories as to its cause, until Prof. J. E. Planchon, of Montpellier, in July, 1868, announced that it was due to the puncture of a minute insect belonging to the plant-louse family (*Aphididae*), and bearing a close resemblance to our gall-louse. The insect was subsequently described, by the same author, from the apterous form, under the name of *Rhizaphis vastatrix*, and not till September of the same year, when the winged insect was discovered, did he give it the name by which it is now so well known. In January, 1869, Prof. J. O. Westwood, of Oxford, announced the receipt of both the gall and root-inhabiting types, from different parts of England and Ireland, and his inability to distinguish between the two. In the same article he announced having received the gall-making type from Hammett in 1863, and having described it by the name of *Peritymbia vitisana*, in a notice communicated to the Ashmolean Society of Oxford, in the spring of 1868, which communication was, however, never published. In the spring of 1869, M. J. Lichtenstein, of Montpellier, first hazarded the opinion that the *Phylloxera*, which was attracting so much attention in Europe, was identical with the American insect described by Dr. Fitch. This opinion gave an additional interest to our insect, and I succeeded in 1870, while the Franco-Prussian war was at its highest, and just before the investment of Paris, in establishing the identity of their gall-insect with ours, through correspondence with, and specimens sent to, Dr. V. Signoret, of that city. During the same year I also established the identity of the gall and root-inhabiting types, by showing that in the fall of the year the last brood of gall-lice betake themselves to the roots and hibernate thereon. In 1871 I visited France and studied their insect in the field; and in the fall of that year, after making more extended observations here, I was able to give absolute proof of the identity of the two insects, and to make other discoveries, which not only interested our friends abroad but were of vital importance to our own Grape growers, especially in the Mississippi Valley. I have given every reason to believe that the failure of the European Vine (*Vitis vinifera*), when planted here, the partial failure of many hybrids with the European *vinifera*, and the deterioration and death of many of the more tender-rooted native varieties, are mainly owing to the injurious work of this insidious little root-louse. It had been at its destructive work for years, producing injury, the true cause of which was never suspected until the publication of the article in my fourth report. I also showed that some of our native varieties enjoyed relative immunity from the insects' attacks, and urged their use for stocks, as a means of re-establishing the blighted Vineyards of Southern France. The disease continued to spread in Europe, and became so calamitous in the last-named country that the French Academy of Sciences appointed a standing *Phylloxera* Committee. It has also attracted much attention in Portugal, Austria, and Germany, and in England where it affects hothouse Grapes. The literature of the subject grew to such vast proportions that, after publishing a biographical review, containing notices and summaries of 482 articles or treatises, published during the four years of 1868-71, MM. Planchon and Lichtenstein gave up the continuance of the work as impracticable. At the suggestion and with the co-operation of the Société Centrale d'Agriculture de l'Hérault, the French Minister of Agriculture last autumn commissioned Prof. Planchon to visit this country and learn all he could about the insect and its effect on our

different Vines. Prof. Planchon arrived here the latter part of August and remained over a month, during which time he visited many prominent Vineyards in the Eastern States, on Kelly's Island, in Missouri, and in North Carolina. His investigations not only fully corroborated all my previous conclusions regarding the Phylloxera, but gave him a knowledge of the quality of our native Grapes and wines which will be very apt to dispel much of the prejudice against them that has so universally possessed his countrymen, who have not followed our recent rapid progress in viticulture and viniculture, but found their opinions on the inferior results which attended the infancy of those industries in America. Such, in brief, is the history of the Grape Phylloxera. Let us now take a closer insight into the nature of this insect. The genus *Phylloxera* is characterised by having three-jointed antennæ, the third or terminal much the longest, and by carrying its wings overlapping flat on the back instead of roof-fashion. It belongs to the whole-winged bugs (Homoptera), and osculates between two great families of that sub-order—the plant-lice (Aphidæ) on the one hand and the bark-lice (Coccidæ) on the other. In the one-jointed tarsus of the larva or newly-hatched louse, and in being always oviparous, it shows its affinities with the latter family, but in the two-jointed tarsus of the more mature individuals, and in all other characters, it is essentially aphididan. "In every department of natural history a species is occasionally found which forms the connecting link between the two genera, rendering it doubtful under which genus it should properly be arranged. Under such circumstances the naturalist is obliged to ascertain, by careful examination, the various predominating characteristics, and finally place it under the genus to which it bears the closest affinity in all its details." So wrote Audubon and Bachman twenty-eight years ago; and what is true of genera is equally true of species, families, and of still higher



Fig. 1. Under side of Leaf covered with Galls.

groups. In the deepest sense all Nature is a whole, and all her multitudinous forms of animal and vegetable life are so closely interlinked, and graduate into each other so insensibly, that in founding divisions on two trivial differences we subvert the objects of classification. Thus, instead of founding a new family for this insect, as Dr. Shimer did, and there seems a tendency on the part of others to do, it is both more consonant with previous custom, and more sensible in every way, to retain it among the Aphidæ. Not the least interesting feature in the economy of our Phylloxera, are the different phases or forms under which it presents itself. Among these forms are two constant types which have led many to suppose that we have to do with two species. The one type which I have, for convenience, called *gallicola*, lives in galls on the leaves; the other, which I have called *radicicola*, on swellings of the roots. The subjoined table will assist to a clear understanding of what follows:

Type 1. *Gallicola*.—(Vitifoliæ, Fitch; Fig. 3, f, g, h.)

Type 2. *Radicicola*.—

a, degraded or Wingless Form. (Fig. 4, e, f, g.)

B, Perfect or Winged Form. (Fig. 5, g, h. Fig. 7, b.)

The *Gallicola*, or Gall-inhabiting Type.

The gall or excrescence produced by this insect is simply a fleshy swelling of the under side of the leaf, more or less wrinkled and hairy, with a corresponding depression of the upper side, the margin of the cup being fuzzy, and drawn together so as to form a fimbriated mouth. It is usually cup-shaped, but sometimes greatly elongated or purse-shaped (fig 2, a, b). Soon after the first Vine-leaves that put out in the spring have fully expanded, a few scattering galls may be found, mostly on the lower leaves, nearest the ground. These vernal

galls are usually large (of the size of an ordinary Pea), and the normal green is often blushed with rose where exposed to the light of the sun. On carefully opening one of them (fig. 3, d) we shall find the mother-louse diligently at work surrounding herself with pale-yellow eggs of an elongate oval form, scarcely .01 inch long, and not quite half as thick (fig. 3, c). She is about .03 inch long, generally spherical in shape, of a dull orange colour, and looks not unlike an immature seed of the common Purslane. At times, by the elongation of the abdomen, the shape assumes, more or less perfectly, the pyriform. Her members are all dusky, and so short compared to

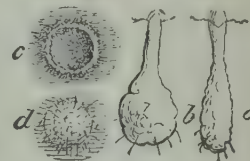


Fig. 2.—a and b, elongated galls; c and d, upper and under side of abortive galls.

her swollen body, that she appears very clumsy, and undoubtedly would be outside of her gall, which she never has occasion to quit, and which serves her alike as dwelling-house and coffin. More carefully examined, her skin is seen to be shagreened or minutely granulated and furnished with rows of minute hairs. The eggs begin to hatch, when six or eight days old, into active little oval, hexapod beings, which differ from their mother in their brighter yellow colour and more perfect legs and antennæ, the tarsi being furnished with long, pliant hairs, terminating in a more or less distinct globule. These hairs were called *digituli* by Dr. Shimer, and they lose their globular tips and become more or less worn with age. In hatching, the eggs split longitudinally from the anterior end, and the young louse, whose pale yellow is in strong contrast with the more dusky colour of the egg-shell, escapes in the course of two minutes. Issuing from the mouth of the gall, these young lice scatter over the Vine, most of them finding their way to the tender terminal leaves, where they settle in the downy bed which the tomentose nature of these leaves affords, and commence pumping up and appropriating the sap. The tongue-sheath is blunt and heavy, but the tongue proper—consisting of three brown, elastic, and wiry filaments, which, united, make so fine a thread as scarcely to be visible with the strongest microscope—is sharp, and easily run under the parenchyma of the leaf. Its puncture causes a curious change in the tissues of the leaf, the growth being so stimulated that the under side bulges and thickens, while the down on the upper side increases in a circle around the louse, and finally hides and covers it as it recedes more and more within the deepening cavity. Sometimes the lice are so crowded that two occupy the same gall. If, from the premature death of the louse, or other cause, the gall becomes abortive before being completed, then the circle of thickened down or fuzz enlarges with the expansion of the leaf, and remains (fig. 2, c) to tell the tale of the futile effort. Otherwise, in a few days the gall is formed, and the inheld louse, which, while eating its way into house and home, was also growing apace, begins a parthenogenetic maternity by the deposition of fertile eggs, as her immediate parent had done before. She increases in bulk with pregnancy, and one egg follows another in quick succession, until the gall is crowded. The mother dies and shrivels, and the young, as they hatch, issue and found new galls. This process continues during the summer until the fifth or sixth generation. Every egg brings forth a fertile female, which soon becomes wonderfully prolific. The number of eggs found in a single gall averages about 200; yet it will sometimes reach as many as 500, and, if Dr. Shimer's observations can be relied on, it may even reach 5,000. I have never found any such number myself; but, even supposing there are but five generations during the year, and taking the lowest of the above figures, the immense prolificacy of the species becomes manifest. Small as the animal is, the product of a single year, even at this low estimate, would encircle the earth over thirty times if placed in a continuous line, each individual touching the end of another. Well it is for us that they are not permitted to multiply in this geometrical ratio! Nevertheless, as summer advances, they do frequently become prodigiously multiplied, completely covering the leaves with their galls, and settling on the tendrils, leaf-stalks, and tender branches, where they also form knots and rounded excrescences (fig. 3, e), much resembling those made on the roots. In such a case, the Vine loses its leaves prematurely. Usually, however, the natural enemies of the louse seriously reduce its numbers by the time the Vine ceases its growth in the fall, and the few remaining lice, finding no more succulent and suitable leaves, seek the roots. Thus, by the end of September, the galls are mostly deserted, and those which are left are almost always infested with mildew (*Botrytis viticola*), and eventually turn brown and then decay. On the roots, the young lice attach themselves singly or in little groups, and thus hibernate. The male gall-louse has never been seen, and there is every reason to believe that he has no existence. Nor does the female ever acquire wings. Indeed, I cannot lay too much stress on the fact that *gallicola* occurs only as an agamic and apterous female form. It is but a transient summer

state, not at all essential to the perpetuation of the species, and does, compared with the other type, but trifling damage. I have found it occasionally on all species of the Grape Vine (*vinifera*, *riparia*, *æstivalis*, and *Labrusca*) cultivated in the Eastern and Middle States, and on the wild *Cordifolia*; but it flourishes only on the River-bank Grape (*riparia*), and more especially on the Clinton and Taylor, with their close allies. Thus, while legions of the root-inhabiting type (*radicicola*) are overrunning and devastating the Vineyards of France, this *gallicola* is almost unknown there, except on such American varieties as it infests with us. A few of its galls have been found at Sorgues, on a variety called Tinto; and others have been noticed on

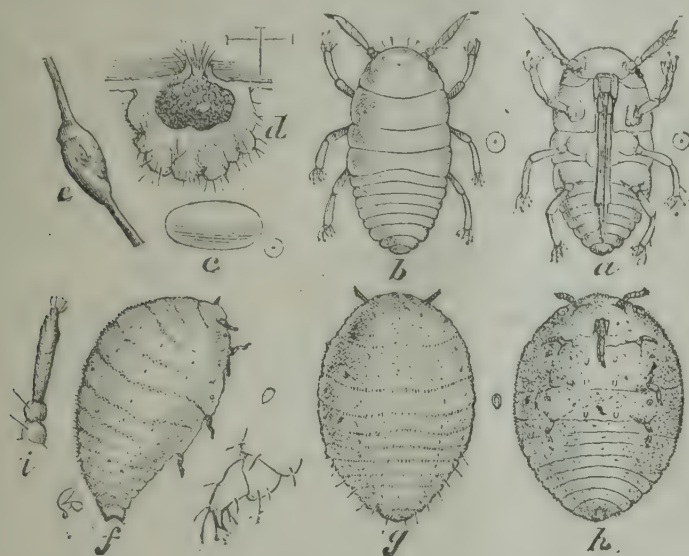


Fig. 3. Type *Gallicola*:—*a*, *b*, newly-hatched larva, ventral and dorsal view; *c*, egg; *d*, section of gall; *e*, swelling of tendril; *f*, *g*, *h*, mother gall-louse—lateral, dorsal, and ventral views; *i*, her antenna; *j*, her two-jointed tarsus. Natural sizes indicated at sides.

vinifera Vines interlocking infested American Vines, or have been produced by purposed contact with the young *gallicola*. Similarly, there are many varieties, especially of *Labrusca*, which, in this country, suffer in the roots, and never show a gall on the leaves. The precise conditions which determine the production and multiplication of *gallicola* cannot now, if they ever can, be stated; but it is quite evident that the nature and constitution of the Vine are important elements, since such Vines as the Herbmont often bear witness, by their leaves covered with abortive galls, to the futile efforts the lice sometimes persist in making to build in uncongenial places. Yet other elements come into play, and nothing strikes the observer

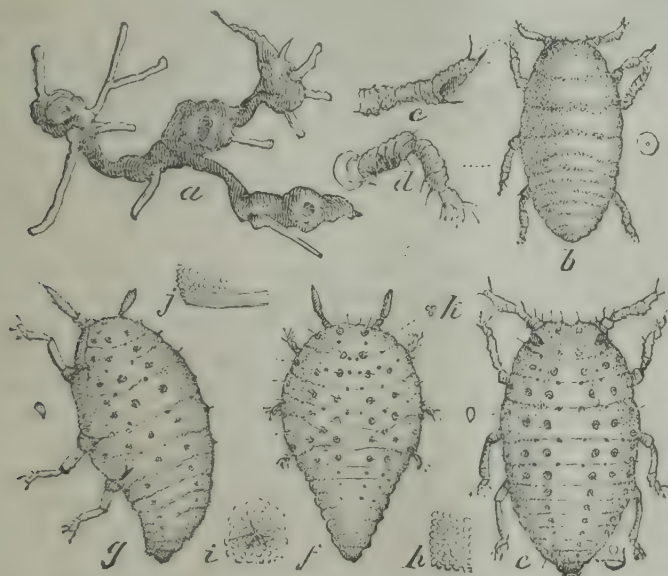


Fig. 4. Type *Radicicola*:—*a*, roots of Clinton Vine, showing relation of swellings to leaf-galls, and power of resisting decomposition; *b*, larva as it appears when hibernating; *c*, *d*, antenna and leg of same; *e*, *f*, *g*, forms of more mature lice; *h*, granulations of skin; *i*, tubercles; *j*, transverse folds at border of joints; *k*, simple eyes.

as more curious and puzzling than the transitory nature of these galls, and the manner in which they are found—now on one variety, now on another. I was formerly inclined to believe that *gallicola* was a necessary phase in the annual cycle of the insect's mutations: in other words, that it was essential to the continuance of the species, and was probably the product of the egg laid by the winged and impregnated female. On this hypothesis I imagined that *gallicola* was probably the invariable precursor of *radicicola* in an uninfested Vineyard, and that, if galls were not allowed to develop in such a Vineyard, it would not suffer from root-lice. More extensive

experience has satisfied me that the hypothesis is essentially erroneous, and that, while the first galls may sometimes be produced by lice hatched from the few eggs deposited above-ground by the winged female, they are more often formed by young lice hatched on the roots, which, wandering away from their earthy recesses, are fortunate enough to find suitable leaf conditions. It is barely possible that under certain circumstances, as, for instance, on our wild Vines, where the soil around the roots is hard and compact, *gallicola* may become more persistent, and pass through all the phases belonging to the species without descending to the roots—the eggs wintering on the ground, or the young under the loose bark, or upon the canes. For a somewhat similar state of things actually takes place with another plant-louse (*Eriosoma pyri*), which in the Western United States normally inhabits the roots of our Apple trees, and only exceptionally the branches; while in the moister Atlantic States, and in England and moister parts of Europe, where it was introduced from this country, it normally infests the branches, and more exceptionally the roots. But there are no facts yet known to prove such to be the case with the Grape *Phylloxera*, even on our wild Vines, and I do not believe that it ever is the case in our cultivated Vineyards. As already indicated, the autumnal individuals of *gallicola* descend to the roots, and there hibernate. There is every reason to believe also that, throughout the summer, some of the young lice hatched in the galls are passing on to the roots; as, considering their size, they are great travellers, and show a strong predisposition to drop, their natural lightness, as in the case of the young cicada, and of other insects which hatch above but live under ground, enabling them thus to reach the earth with ease and safety. At all events, I know, from experiment, that the young *gallicola*, if confined to Vines on which they do not normally, and perhaps cannot, form galls, will, in the middle of summer, make themselves perfectly at home on the roots.

The *Radicicola* or Root-inhabiting Type.

We have seen that, in all probability, *gallicola* exists only in the apterous, shagreened, non-tubercled, fecund female form. *Radicicola*, however, presents itself in two principal forms. The newly-hatched larvæ of this type are undistinguishable, in all essential characters, from those hatched in the galls; but in due time they shed the smooth larval skin and acquire raised warts or tubercles which at once distinguish them from *gallicola*. In the development from this point the two forms are separable with sufficient ease; one (*a*) of a more dingy greenish-yellow, with more swollen fore-body, and more tapering abdomen; the other (*B*) of a brighter yellow, with the lateral outline more perfectly oval, and with the abdomen more truncated at tip. The first or mother form (fig. 4, *f*, *g*,) is the analogue of *gallicola*, as it never acquires wings, and is occupied, from adolescence till death, with the laying of eggs, which are less numerous and somewhat larger than those found in the galls. I have counted in the spring as many as 265 eggs in a cluster, and all evidently from one mother, who was yet very plump and still occupied in laying. As a rule, however, they are less numerous. With pregnancy this form becomes quite tumid and more or less pyriform, and is content to remain with scarcely any motion in the more secluded parts of the roots, such as the creases, satures, and depressions, which the knots afford. The skin is distinctly shagreened (fig. 4, *h*), as in *gallicola*. The warts, though usually quite visible with a good lens, are at other times more or less obsolete, especially on the abdomen. The eyes, which were quite perfect in the larva, become more simple with each moult, until they consist, as in *gallicola*, of but triple eyelets (fig. 4, *k*), and, in the general structure, this form becomes more degraded with maturity, wherein it shows the affinity of the species to the Coccidæ, the females of which, as they mature, generally lose all trace of the members they possessed when born. The second or more oval form (fig. 4, *e*) is destined to become winged. Its tubercles, when once acquired, are always conspicuous; it is more active than the other, and its eyes increase rather than diminish in complexity with age. From the time it is one-third grown, the little dusky wing-pads may be discovered, though less conspicuous than in the pupa state, which is soon after assumed. The pupæ (fig. 5, *e*, *f*) are still more active, and, after feeding a short time, they make their way to the light of day, crawl over the ground and over the Vines, and finally shed their last skin and assume the winged state. In this last moult the tubercled skin splits on the back, and is soon worked off, the body in the winged insect having neither tubercles nor granulations. In the great majority of insects the wings in the pupa are simply compressed and thickened without being folded, and in the imago they expand without material change in form. Those of our *Phylloxera* are rolled up both from the sides and the end, and, in expanding, they unroll in the manner designated at figure 6, *d*, *e*, *f*—the whole operation requiring but about five minutes. At first, and for some time after the moult, the

colour of the body of the new-fledged Phylloxera is of a uniform bright deep yellow, with the wings white and rather opaque, and the eyes brown. The dark thoracic band and more diaphanous and smoky nature of the wings are gradually acquired in the course of a day, and the insect finally presents the appearance of figure 5, *g*, *h*. The wings, when highly magnified, are seen to be thickly covered with minute hooks (fig. 7, *f*). These winged insects are most abundant in August and September, but may be found as early as the 1st of July, and until the Vines cease growing in the fall. The majority of them are females, with the abdomen large, and more or less elongate. The veins of the front wing are not connected (fig. 6, *a*), and, by virtue of the large abdomen, the body appears somewhat constricted behind the thorax. From two to five eggs may invariably be found in the abdomen of these, and are easily seen when the insect is held between the light, or mounted in balsam or glycerine. A certain proportion have an entirely different shaped and smaller body, the abdomen being short, contracted, and terminating in a fleshy and dusky protuberance; the limbs stouter, and the wings proportionately larger and stouter, with their veins connecting (fig. 6, *b*). I have never found perfect eggs in the abdomen of this shorter form, but, instead, several vesicles (fig. 7, *e*) containing granulations in sacs; and this form has been looked upon as a probable male by myself and others in the past. But in the light of present knowledge it must be looked upon as merely an abnormal female, and the vesicles as immature eggs. Balbiani made the curious discovery, in the annual development of Phylloxera quercus, that the winged individuals, which appear in August, fly off to new leaves and deposit their unimpregnated eggs, to the number of five to eight. These eggs are of two different sizes, the smaller being readily separated from the larger. They hatch in about a dozen days, the smaller giving birth to males, and the larger to females, which have neither mouth-parts nor digestive organs, and neither grow nor moult after birth. The sole aim of their existence is the reproduction of the species, and they crawl actively about and gather in little multitudes in the crevices and interstices which are afforded them. Four or five days after birth the female lays a solitary egg, which, increasing somewhat after impregnation, had caused her abdomen to swell and enlarge a little prior to oviposition. Two or three days after this operation the mother dies; but the male lives as long again. This solitary egg, which Balbiani calls the winter egg, soon takes on a dark colour, which indicates its fecundity and distinguishes it from parthenogenetic eggs of both the winged and wingless females. It is surmised that this egg passes the winter to give birth in spring to the form destined to recommence the cycle of development belonging to the species. These discoveries are truly remarkable, and appear to me all the more so since Balbiani likewise found that the individuals which never become winged attain maturity without laying eggs on the leaves on which they were born, but crawl on to the branches and in the interstices of the old scales at the base of the new year's growth. There they lay a

number of eggs, which are absolutely like those deposited by the winged females, and, like them, produce the sexual individuals, *i.e.*, both males and females. M. Maxime Cornu has already announced having found a sexual individual, without mouth-parts, of the Grape Phylloxera; and it is quite likely, now that Balbiani has paved the way, that we shall this year have its natural history complete. But whether the Grape Phylloxera produces this fecundated and solitary egg or not, such an egg is neither essential to its winter life, nor to that of an American species (Phylloxera Rileyi), which will be described further on, and which is, in every respect, very closely allied to the European quercus. The Grape Phylloxera has been found to agree precisely with its Oak congener in the sexual character of the progeny from the winged females; and, indeed, these sexed individuals have now been traced in the Oak and Grape species (quercus and vastatrix) in Europe, in three species (Rileyi, vastatrix and what is probably caryæcaulis) in America. Balbiani has also proved the analogy between the two species to be still more perfect, in that

many of the underground wingless females also, towards the end of autumn, lay eggs of two sizes, which give birth to the true mouthless and wingless males and females, undistinguishable in structure and function from the progeny of the winged females. We thus have the spectacle of an underground insect possessing the power of continued existence even when confined to its subterranean retreats. As fall advances the winged individuals become more and more scarce; and, as winter sets in, only eggs, newly-hatched larvæ, and a few apterous egg-bearing mothers are seen. These last die and disappear during the winter, which is mostly passed in the larva state, with here and there a few eggs. The larvæ thus hibernating (fig. 4, *b*), become dingy, with the body and limbs more shagreened and the claws and digituli less perfect than when first hatched; and, of thousands examined, all bear the same appearance, and all are furnished with strong suckers. As soon as the ground thaws and the sap starts in the spring, these young lice work off their winter coat, and, growing apace, commence to deposit eggs. I have examined thousands in the Vineyard in early spring, and other thousands reared artificially in a warm room in

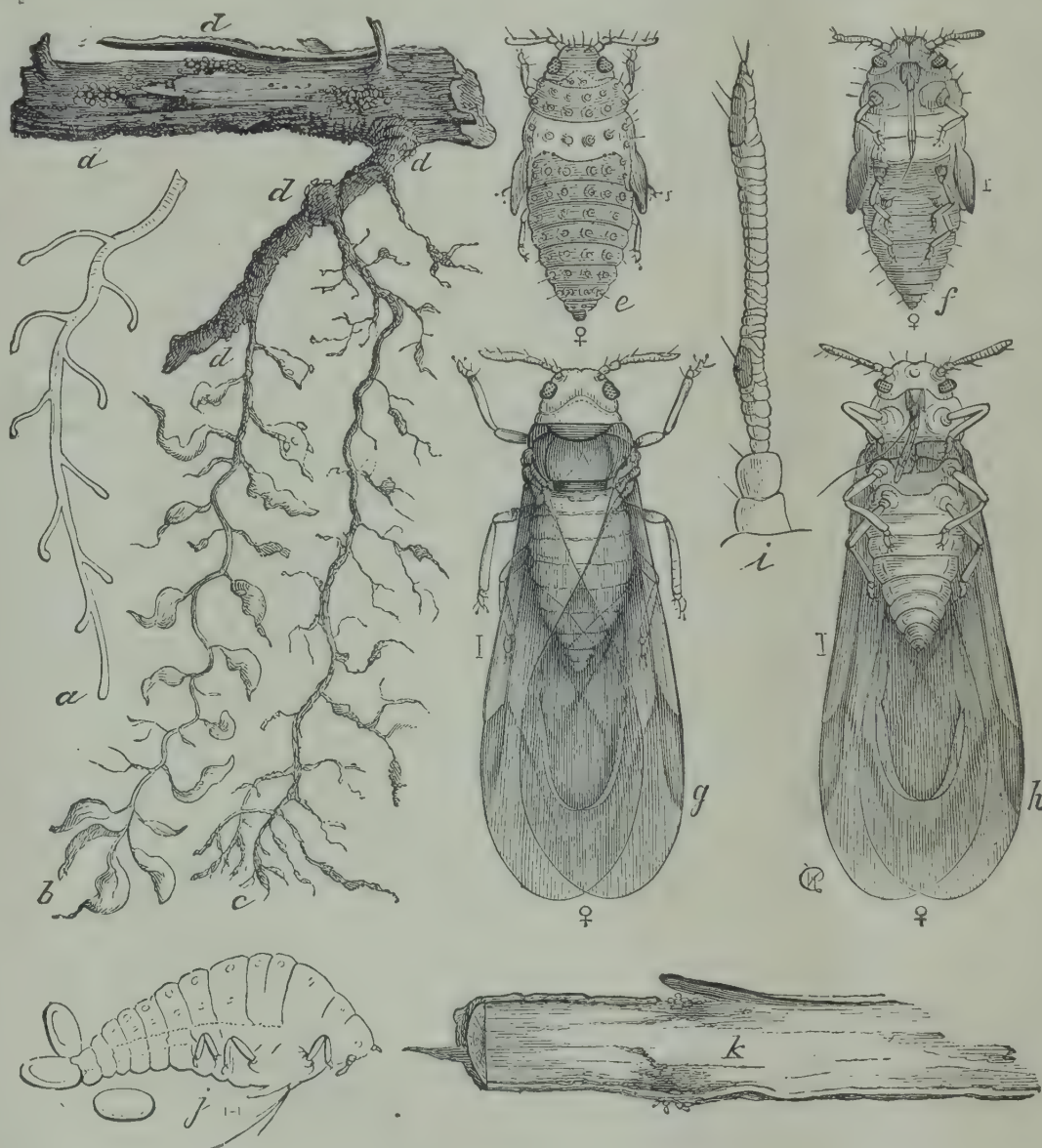


Fig. 5. Type Radicicola:—*a*, shows a healthy root; *b*, one on which the lice are working, representing the knots and swellings caused by their punctures; *c*, a root that has been deserted by them, and where the rootlets have commenced to decay; *d*, *d*, *d*, show how the lice are found on the larger roots; *e*, female pupa, dorsal view; *f*, same, ventral view; *g*, winged female, dorsal view; *h*, same, ventral view; *i*, magnified antenna of winged insect; *j*, side view of the wingless female, laying eggs on roots; *k*, shows how the punctures of the lice cause the larger roots to rot.

winter, and all, without exception, assumed the degraded form (*a*) already described. At this season of the year, with the exuberant juices of the plant, the swellings on the roots are large and succulent, and the lice plump to repletion. One generation of the mother form follows another—fertility increasing with the increasing heat and luxuriance of summer—until at least the third or fourth has been reached before the winged form makes its appearance in the latter part of June or early in July. Such are the main features which the development of the insect presents to one who has studied it in the field as well as in the closet. This polymorphism, which at first strikes us as singular, is quite common among plant lice, and many curious instances of still more striking character might be given. Even the differences themselves between gallicola and radicola are

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more apparent than real. Individuals of the latter are often met with, which, in the comparative obsolescence of their tubercles, are almost undistinguishable from the former; and the tubercles, like many other purely dermal appurtenances, are of an evanescent and unimportant character. Many insect larvæ, which are normally granulated with papillæ, not unfrequently have these more or less obsolete, and at some stages of growth have the skin absolutely smooth. The same thing holds true of tubercles, which, as in the case of the Imported Currant worm (*Nematus ventricosus*), are often completely cast off at a moult. In *Phylloxera* they are often very variable in size, as we shall see in Rileyi; and in quercus, according to several trustworthy authors, the tubercles which are characteristic of the species in Southern France are entirely wanting round Paris. If we carefully study them in vastatrix, we shall find that they consist of points where the granulated skin is gathered round a fleshy



Fig. 6. Pterogostic Characters:—*a*, *b*, different venation of front wing; *c*, hind wing; *d*, *e*, *f*, showing development of wings.

hair in little rugosities, and becomes darker (fig. 4, *i*). They do not occur in the newly-hatched larva, are not visible immediately after each moult, and are lost again in the winged individuals. In the form gallicola we shall find, upon careful examination, especially of the exuvia, that, as Max. Cornu has shown, there are rows of short hairs, extending beyond the natural granulations, and corresponding to those on the tubercles of radicolola. These hairs are more visible on the younger and smoother lice after the first moult; and they are sometimes so stout, particularly on the abdomen, as to remind one of those on Rileyi, to be described. The ventral characteristics of the two types are identical. Since I proved, in 1870, the absolute identity of these two types by showing that the gall lice become root lice, the fact has been repeatedly substantiated by different

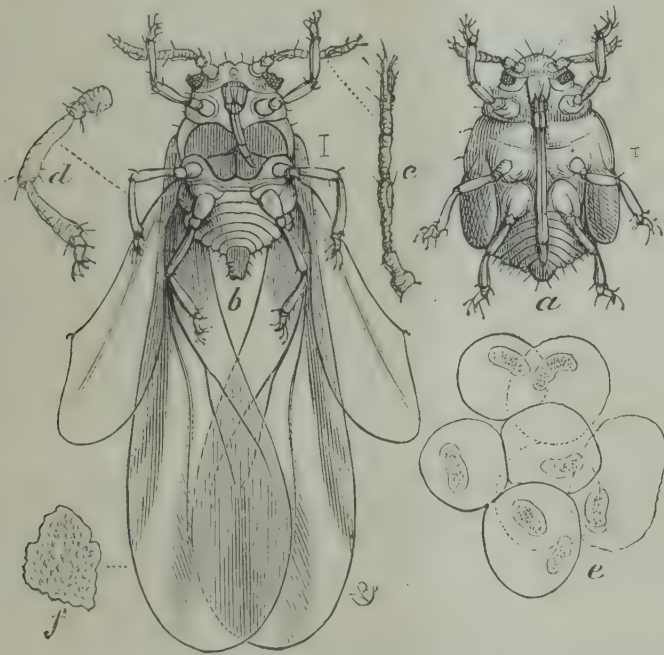


Fig. 7. Type Radicolola:—*a*, *b*, pupa and imago of a short-bodied form, once supposed to be the male; *c*, *d*, its antenna and leg; *e*, vesicles found in abdomen.

observers. Yet, strange to say, no one has heretofore succeeded in making gall lice of the young hatched on the roots, though I formerly supposed that Signoret had done so. It is, therefore, with much satisfaction that I record the fact of having succeeded this winter in obtaining galls on a young Clinton Vine from young radicolola, and of thus establishing, beyond question, the specific interrelation and identity of the two types. I make this announcement with all the more pleasure, that for three years past, both on Vines growing out-doors and in pots indoors, I had in vain attempted to obtain the same result.

External Effects of the Disease.

The result which follows the puncture of the root-louse is an abnormal swelling, differing in form according to the particular part and texture of the root. These swellings, which are generally

commenced at the tips of the rootlets, where there is excess of plasmatic and albuminous matter, eventually rot, and the lice forsake them and betake themselves to fresh ones—the living tissue being necessary to the existence of this as of all plant-lice. The decay affects the parts adjacent to the swellings, and on the more fibrous cuts off the supply of sap to all parts beyond. As these last decompose, the lice congregate on the larger ones, until at last the root system literally wastes away. During the first year of attack there are scarcely any outward manifestations of disease, though the fibrous roots, if examined, will be found covered with nodosities, particularly in the latter part of the growing season. The disease is then in its incipient stage. The second year all these fibrous roots vanish, and the lice not only prevent the formation of new ones, but, as just stated, settle on the larger roots, which they injure by causing hypertrophy of the parts punctured, which also eventually become disorganised and rot. At this stage the outward symptoms of the disease first become manifest, in a sickly yellowish appearance of the leaf and a reduced growth of cane. As the roots continue to decay, these symptoms become more acute, until by about the third year the Vine dies. Such is the course of the malady on Vines of the species vinifera, when circumstances are favourable to the increase of the pest. When the Vine is about to die it is generally impossible to discover the cause of the death, the lice, which had been so numerous the first and second years of invasion, having left for fresh pasturage.

Mode of Spreading.

The gall-lice can only spread by travelling, when newly hatched, from one Vine to another; and if this slow mode of progression were the only one which the species is capable of, the disease would be comparatively harmless. The root-lice, however, not only travel under-ground along the interlocking roots of adjacent Vines, but crawl actively over the surface of the ground, or wing their way from Vine to Vine, and from Vineyard to Vineyard. Doubts have been repeatedly expressed by European writers as to the powers of such a delicate and frail-winged fly to traverse the air to any great distance. On a calm, clear day, the latter part of last June, it was my fortune to witness a closely allied species (*Phylloxera caryæfoliæ*), of the same size and proportions, swarming on the wing to such an extent that to look against the sun revealed them as a myriad silver specula. They settled on my clothing by dozens, and any substance in the vicinity that was the least sticky was covered with them. With such a sight before one's eyes, and with full knowledge of the prolificacy of these lice, it required no effort to understand the fearful rapidity with which the *Phylloxera* disease has spread in France, or the epidemic nature it has assumed. Imagine such swarms, mostly composed of egg-bearing females, slowly drifting, or more rapidly blown, from Vineyard to Vineyard; imagine them settling upon the Vines, and depositing their eggs, which give birth to fecund females, whose progeny in five generations, and probably in a single season, may be numbered by billions, and you have a plague (should there be no conditions to prevent that increase) which, though almost invisible and easily unnoticed, may become as blasting as the plagues of Egypt. As early as 1871 I showed with what facility and power the species referred to in the above extract can take wing when the atmospheric conditions are favourable; and on the 27th of last September, the weather being quite warm and summer-like, with much moisture in the atmosphere, I witnessed the same power of flight in the Grape *Phylloxera*. Some two hundred winged individuals, which I had confined, became very active and restless, vigorously vibrating their wings and beating about their glass cages. Upon opening the cages, the lice began to dart away and were out of sight in a twinkling. They have been caught in spider-webs in Europe, and I have repeatedly captured them on sheets of paper prepared with bird-lime and suspended in an infested Vineyard; and am satisfied that they can sustain flight for a considerable time under favourable conditions, and, with the assistance of the wind, they may be wafted to great distances. These winged females are much more numerous in the fall of the year than has been supposed by entomologists. Wherever they settle, the few eggs which each carries are sufficient to perpetuate the species, and thus spread the disease, which, in the fullest sense, may be called contagious. Whether in a state of Nature these winged females show a preference for any one part of the Vine in the consignment of their eggs is not yet known. It is quite certain, however, that they do not re-enter the ground, though they may, and probably do, often push their eggs into the minute cracks and crevices in the surface of the ground. In confinement I have had such eggs deposited both on the leaves and on the buds, and from the preference which, in ovipositing, these aerial mothers showed for little balls of cotton placed in the corners of their cages, I infer that the more tomentose portions of the Vine, such as the bud, or the base of a leaf-stem, furnish a desirable *nidi*. On this hypothesis it is quite possible for the insect to be introduced from Vine-

yard to Vineyard, or from country to country, as well upon cuttings as upon roots. The sexual individuals, already referred to, from the unimpregnated winged females, hatch in ten or twelve days after the laying of the eggs, under favourable conditions of temperature and moisture. It is possible, however, that the later deposited eggs remain unhatched throughout the winter. Yet where I have supplied these winged mothers with earth, they have repeatedly left their eggs in the cracks of the surface, especially between the earth and the walls of whatever vessel they were confined in; and as they have an inveterate habit of elongating the abdomen and turning the tip from side to side as if feeling for some fissure; and as the eggs require moisture, and hatch most readily within such crevices of moist earth, the soil is perhaps the natural means, especially around the base of the Vine.

Susceptibility of Different Vines to the Disease.

As a means of coping with the Phylloxera disease, a knowledge of the relative susceptibility of different varieties to the attacks and injuries of the insect is of paramount importance. As is so frequently the case with injurious insects, and we have a notable instance in the common Currant Aphis (*Aphis Ribesii*), which badly affects the leaves of some of the Currants, but never touches the Gooseberry which belongs to the same genus, the Phylloxera shows a preference for, and thrives best on, certain species, and even discriminates between varieties; or, what amounts to the same thing practically, some varieties resist its attacks, and enjoy a relative immunity from its injuries. It would, I fear, be useless, and certainly unnecessary here, to attempt to ascertain the reason why certain Vines thus enjoy exemption, while others so readily succumb; but in a broad way it may be stated that there is a relation between the susceptibility of the Vine and the character of its roots—the slow-growing, more tender-wooded, and, consequently, more tender-rooted varieties succumbing most readily; the more vigorous growers resisting best.

Prevention of the Disease.

It occurred to me that by grafting the more susceptible on the roots of the more resistant varieties, we might, in a great measure, counteract the disease, even if all other remedies failed. In the Grape-growing districts of France, where the disease is so sweeping, and where the Grape is so exclusively grown that it affects whole communities, the people may be obliged, and can afford to go to much labour and expense in the use of insecticides to save their Vines. Such insecticides may also be used in this country, where it is desired to save a few choice Vines regardless of expense and time. But I greatly fear that no direct remedy for such an underground enemy will ever be discovered that will not entail too much labour and expense to be used, to any great extent, by our own Grape growers, who will either prefer to confine their attention to varieties which resist, or abandon the business entirely. Yet if it shall once be demonstrated that varieties which now fail may be grown when grafted on those which resist, I see no reason why it should not become as much a custom and a maxim among Grape-growers, to use some other Vine as stock for such varieties, as it already is among Pear growers to use the Quince, or among Cherry growers to use Mahaleb, Mazard, or Morello, as stocks. In the course of a year or two we shall be able to fairly judge of the efficacy of the plan, for, aside from the trials that I am making in this country, others are being made on an extensive scale in France. Quite a number of plants, for the purpose of experiment, were sent over there from this country in the spring of 1872; and the demand has now become so great that a single firm, Isidor, Bush & Co., of St. Louis, has lately received orders for about four hundred thousand cuttings to be consigned to one place, Montpellier, and consisting of such varieties as have been recommended by Prof. Plançon and myself as best resisting the disease. There is every reason to hope for the best results from these importations, as the Vines which best resist here, and which were planted there in 1871 and 1872, in Phylloxera-infested districts, have, thus far, done surprisingly well, as MM. J. Leenhardt-Pomier, V. Pulliat, and others, testify.

Other Preventive Measures.

In planting a new Vineyard, the greatest care should be taken not to introduce the Phylloxera on the young plants, and a bath of weak lye or strong soap-suds before planting will, perhaps, prove the best safeguard. Remembering that the lice are spreading over the ground from July till fall, and principally in the months of August and September, a thorough sprinkling of the surface with lime, ashes, sulphur, salt, or other substance destructive to insect life, will, no doubt, have a beneficial effect in reducing their numbers and preventing their spread. The insect has been found to thrive less, and to be, therefore, less injurious in a sandy soil; while a mixture of soot with the soil has had a beneficial effect in destroy-

ing the pest. I have therefore recommended for the more susceptible varieties that they be planted in trenches first prepared with a mixture of sand and soot. An addition of lime will also prove beneficial. There is every reason to believe that Vines are rendered less susceptible to the disease by a system of pruning and training that will produce long canes and give them as nearly as possible their natural growth.

Natural Enemies.

There are a number of different predaceous insects which serve to keep the leaf-lice in check; but, as the injury is mostly done underground, it will suffice to enumerate the principal of these in this connection. The most efficient is a black species of Fringe-

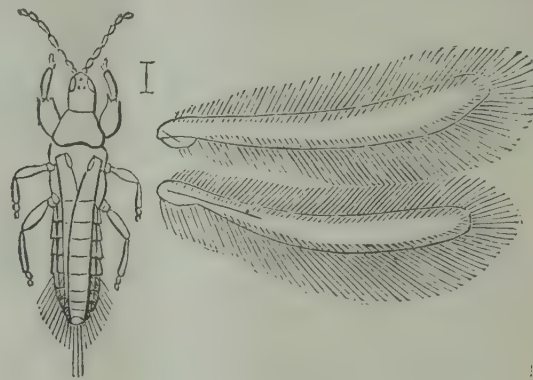


Fig. 8. Thrips.

wing, or Thrips with white wings (*Thrips phylloxerae*). The egg, which is thrice as large as that of the louse, ellipsoidal, and with a faceted surface, is deposited within the gall among its legitimate inhabitants; and the young Thrips, which differ from their parents not only in lacking wings but in being of a blood-red colour, with only the extremities and the members black, play havoc with the lice. They are active supple creatures, and turn up menacingly the posterior part of the body when disturbed. They are found in several different kinds of Phylloxera galls, and do more than any other species to keep the leaf-inhabiting Grape

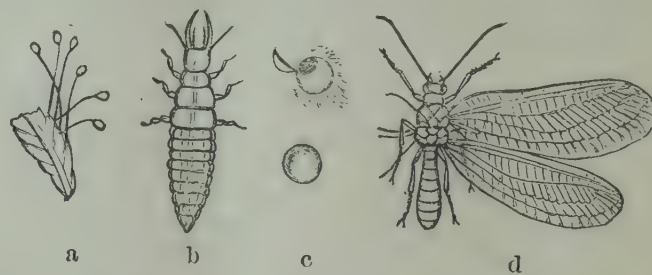


Fig. 9. Lace-wing Fly:—a, eggs; b, larva; c, cocoon; d, fly.

Phylloxera within bounds. The next most efficient aid in the destruction of the leaf-lice is found among the lace-wing flies, two species of which, more especially, viz.: the weeping lace-wing (*Chrysopa plorabunda*) and the consumptive lace-wing (*C. tabida*), I find very frequently within the galls devouring their contents. These flies are known by their brilliantly golden eyes and the offensive odour which some of them emit. The eggs are adroitly deposited (fig. 9, a) at the tip of long, silk-like stalks, in order to prevent the first-born larvae from exercising their cannibalistic propensities on their yet unborn brethren. The larva (fig. 9, b) is

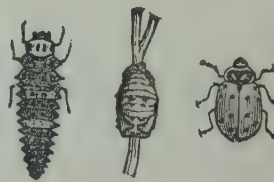


Fig. 10. Lady Bird:—Larva, pupa, and beetle.

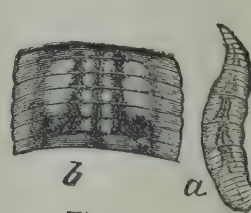


Fig. 11. Syrphus Larva.



Fig. 12. Syrphus Fly.

very rapacious, and, when ready to transform, winds itself up into a wonderfully small cocoon (considering the size of the insect which makes it, and which issues from it) which is spun from the extremity of the body and from which it issues, when about to acquire wings, through a neatly-cut, circular aperture. Next in order, as Phylloxera enemies, may be mentioned the lady birds (*Coccinella*), especially certain small, dark-brown species belonging to the genus *Scymnus*, and whose young, thickly covered with white and evenly-shorn tufts of a cottony secretion, are frequently found at their good work within the galls. Following

these may be mentioned, as auxiliaries, certain Syrphus-fly larvæ, which, being blind, go groping about among the eggs and young lice which they seize and suck to death. Also certain orange larvæ of a smaller two-winged fly (*Leucopis*); a few genuine bugs (*Heteroptera*), and notably the Insidious Flower-bug (*Anthocoris insidius*, fig. 13), and certain smaller Hymenopterous parasites. The enemies known to attack the Phylloxera under ground are, naturally enough, fewer in number. In one instance, I have found a *Scymnus* larva at the work six inches below the surface, and there is a Syrphus fly (*Pipiza radicum*, fig. 14), whose larva lives under ground and feeds both on the Apple tree root-lice, and on this Grape root-lice. Wonderful, indeed, is the instinct which teaches this blind larva to penetrate the soil in search of its prey; for the egg must necessarily be laid at the surface. But, though the under ground enemies of its own class are few, I have discovered a mite which preys extensively upon this root-inhabiting type, and which renders efficient aid in keeping it in check in this country. This mite (*Tyroglyphus phylloxerae*, fig. 15) belongs to the same genus as the cheese and meal mites (*T. siro*), and the species (*T. entomophagus*) which infests preserved insects and is such a pest in cabinets. As is the rule with mites, it is born with but six legs, but acquires eight after the first or second moults. It varies considerably in form, with age, and in studying it with a view of distinguishing it specifically from other described species, I have



Fig. 13. Insidious Flower Bug.

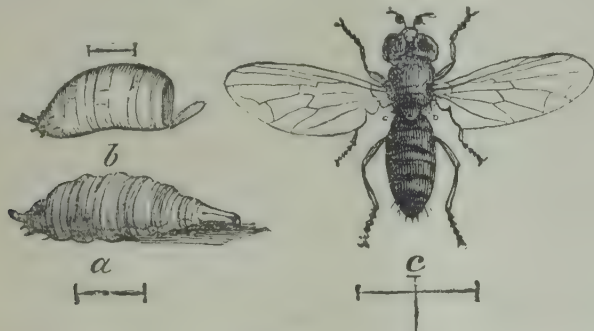


Fig. 14. Root-lice Syrphus Fly:—a, larva; b, pupa; c, fly.

noticed all the different tarsal characters shown as *d*, *f*, *g*, and *h* (fig. 15), and on which distinct genera have been founded. Mites present themselves in such different forms that the adolescent stages of the same species have been made to represent distinct families by authors who never studied the development of these beings. Thus the genera *Astoma*, *Leptus*, *Caris*, *Myobia*, &c., are now known to be but the larval forms, some of them commonly met with as such but not yet connected with the more perfect and more mature forms. The different species of *Tyroglyphus*, so far known, prey on vegetal and animal substances, particularly when these

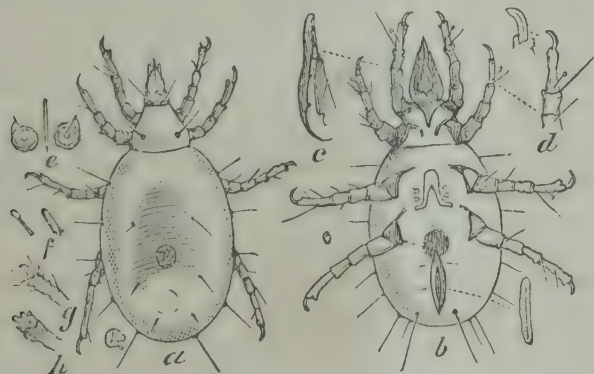
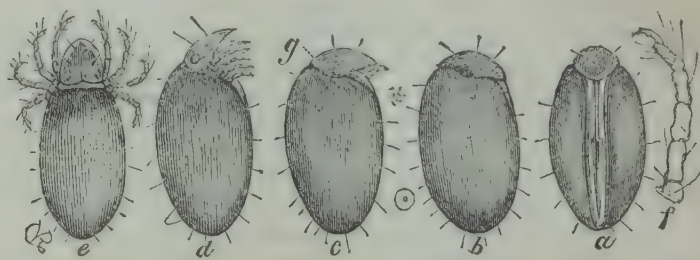


Fig. 15. Phylloxera Mite:—a, dorsal; b, ventral view of female; c, mouth-parts; d, f, g, h, forms of tarsal appendages; e, ventral tubercles of male.

are in a decaying or putrescent condition. In one of their forms (*Hypopus*) they are also known to be externally parasitic on living animals. The species under consideration combines both habits, as when young it mostly contents itself with the altered sweets of the roots which rot from the punctures of Phylloxera, while, when older, it preys by preference on the lice themselves. A singular feature in the life-history of many of the species of the genus *Tyroglyphus* is the fact that under certain conditions an entirely different form, with a hard brown chitinous covering or shield, and characterised by Dugès as a new genus by the name of

Hypopus, develops within the softer body, and finally issues from it by splitting open the softer skin. Claparède, who believed this form to be the male, has carefully described and figured the process of change in the European *Hypopus Dujardini*, and that *Tyroglyphus phylloxerae* has its *Hypopus* form was independently proved by Prof. Planchon and myself—the letters announcing the observations on either side having crossed *en route*. *Hypopus*, as already stated, has been found preying upon living animals. *Tyroglyphus* is a slow traveller, and with its soft body cannot endure exposure to the air, or resist the attacks of other minute animals. Yet it is ubiquitous, living both above and below ground, and swarming on decomposing animal and vegetal substances. When these have once been consumed or reduced to dry powder, what becomes of the swarming mites? M. Maguin has, I think, rightly answered the question. All adult and old mites, together with the young hexapod larvæ, perish; but those in the adolescent stage, the octopod pupæ, are preserved by their power of putting on a coat of mail which protects them against external influences until they can attach themselves to some living and moving animal (flies, beetles, spiders, millipeds, and larger animals), which become their carriers and transport them to places

Fig. 16. *Hoplophora arctata*:—a, b, c, d, e, different attitudes assumed by it; f, strongly magnified leg.

which they could otherwise never reach, and where, finding appropriate food, they throw off the disguise and breed as *Tyroglyphs*, with their well-known fecundity. Associated with this predaceous mite, I have found another (*Hoplophora arctata*, Fig. 16), of very curious form, reminding one strongly of a mussel; and I refer to it in this connection because I once strongly suspected it likewise to be, in some way, related to the soft-bodied *Tyroglyphs*. In studying these mites and their habits, I had frequently filled vessels with Grape roots from which all but *Tyroglyphs* and *Phylloxerae* had, to all appearance, been carefully excluded; only to find, on subsequent examination, a number of these mussel-like *Hoplophoras* and a corresponding decrease in the number of *Tyroglyphs*. This happened more especially in the fall of the year, and I could not help suspecting that the former might prove to be a winter or hibernating form of the latter. There is so much yet to learn of the polymorphism of mites that the suspicion may yet prove justifiable. But with our present knowledge it is safest to explain the facts above stated on the ground that the *Hoplophoras* were at first buried, and consequently invisible, within the roots examined, and that the decrease in the number of *Tyroglyphs* was owing to death and other causes—an explanation which is all the more plausible from the fact that I subsequently found the same narrow-bodied *Hoplophora* swarming in decaying Cotton-wood logs. *Hoplophora* (meaning armed or weapon-carrier) is an anomalous genus belonging to a curious family of mites (*Oribatidæ*), distinguished, as Nicolet well sets forth, from all other families by having a hard covering which is analogous to that of many hexapods, but less elastic or yielding, so that, while resisting a great degree of pressure, when it once gives way, it cracks and fractures with the brittleness of glass. These coverings are differently formed and sculptured, and frequently ornamented with protecting spines. The mites of this family are also distinguished from other mites by their organs of respiration which are at the superior base of the cephalothorax, and look like eyes, being rounded elevations surmounted by a hair. The family comprises two great divisions:—First, those which in the larva state have a form and appearance widely different from those of the adult, which are assumed only at the last moult. Second, those which are born more in the image of the adult form, to which they gradually approach by each successive moult. The genus *Hoplophora*, according to Nicolet, is further anomalous by being born with eight legs, whereas all other mites, even those of its own family, are born with but six; Claparède, however, shows that at least one species (*H. contractilis*) is hexapod before the first moult. Another peculiarity belonging to it is the mobility of the cephalothoracic shield, which closes over the abdomen and fits tight like the lid of a box, whenever the animal withdraws its head and limbs, which it does on the slightest disturbance. Indeed, the hardened body-covering is admirably constructed for the purpose of protection. The species under consideration differs from all others described in the form of the horny covering, which is so narrow that the animal

topples over on its side the moment the limbs are withdrawn. Since the discovery of this Phylloxera-feeding Tyroglyph in America, numerous sensational and exaggerated newspaper articles have appeared, glowingly describing how the French Vineyards are to be saved from the ravages of the Phylloxera by the introduction of this its enemy; and I have received several orders from Europe for supplies of the cannibal. Professor Planchon, it is true, will attempt to introduce it, and we hope with success; but, from what is here said, it is evident that the enthusiasts who expect so much are doomed to disappointment.

Direct Remedies.

The leaf-lice, which do not play such an important part in the disease as was at first supposed, may be controlled with sufficient ease by a little care in destroying the first galls which appear, and in pruning and destroying the terminal growth of infested Vines later in the season. The root-lice are not so easily reached. As the effort will be according to the exigency, we may very naturally look to France for a direct remedy, if one be ever discovered; but of all the innumerable plans, patented or non-patented, that have been proposed—of all the many substances that have been experimented with under the stimulus of a large national reward, no remedy has yet been discovered which gives entire satisfaction, or is applicable to all conditions of soil. Nor is it likely that such a remedy ever will be discovered. A large majority of the remedies proposed, such as the planting of *Madia sativa* among the Vines to catch the insect by its viscous property, or inoculating the Vines with the essence of *Eucalyptus globulus*, are, upon their face, unworthy of practical consideration, or absurd. These we will pass by, and briefly mention only those which have been more or less productive of good. Submersion, where practicable, and where it is total and sufficiently prolonged, is a perfect remedy. This is what even the closest student might expect, as he finds that excessive moisture is very disastrous to the lice. M. Louis Faucon, of Graveson (Bouche du Rhône), France, has abundantly proved its efficacy, and has, by means of it, totally annihilated the insect in his Vineyard, which was suffering from it four years ago. From his experience we may draw the following conclusions:—1. The best season to submerge is in autumn (September and October), when the lice are yet active and the Vines have ceased growing. Submergence for twenty-five to thirty days, at this season, will generally rout the lice. 2. A submergence of forty to fifty days, in winter, is required, and even where the water is allowed to remain during the whole of this season, the Vineyard does not suffer. [I should consider this very doubtful.] 3. A Vineyard should never be inundated for a longer period than two days in summer, or during growth; and though these brief inundations at that season, affect only the few lice near the surface, and are by no means essential, they are nevertheless important auxiliaries to the more thorough fall or winter submersion, as they destroy the few lice which are always invading a Vineyard in infested districts. These summer inundations will be necessary only after the winged insects begin to appear; and three or four, each lasting less than two days, made between the middle of July and the fall of the leaf, will effect the end desired. 4. An embankment should be made around the Vineyard in order that the water may evaporate and permeate the earth, but not run on and carry away any nutritive properties of the soil. The varied success which has attended the different attempts to rout the enemy by inundation, is owing to the lack of thoroughness in many of them. The ground must be thoroughly soaked for a sufficient length of time. Temporary irrigation does not accomplish the end, for the reason that it does not reach all the lice, and does not break up the numerous air bubbles which form in the soil and prevent the drowning of many of the insects. On our best hilly Vine land, thorough submersion is impracticable; but, on our bottom lands some of the Grapes which fail now may be made to succeed by its means. Of 140 different applications made by an intelligent and competent commission in the department of Hérault, France, most of the pure insecticides proved valueless. Many of them, such as carbolic acid, oil of cade, arsenious acid, sulphide of calcium, sulphide of mercury, arsenate of potash, &c., will effectually kill the insect when brought in direct contact with it; but in field practice they can either not be brought in this direct contact, or else cannot be used strong enough to kill all the lice without injuriously affecting the Vine. Carbolic acid, added to water at the rate of about one per cent., applied by pouring into deep holes made by a crow-bar or auger, has given satisfactory results; and a thorough application of soot has also been strongly advocated by those who have tried it. In the experiments that I have been able to make in a small way, a thorough mixing with the soil of a cheap carbolic powder, has given good results. The latest insecticide that has attracted attention and given great hopes in France, is the bi-sulphide of carbon. It seems to have been used as early as 1869 by Baron

Thénard, but was brought prominently before the public last autumn by Messrs. Monestier, Lautand and d'Ortoman, who first proposed to introduce it at a great depth in the soil, so as to utilise its vapour. A vapour will naturally have the advantage over a liquid, as it will more effectually permeate the soil and reach the lice. The simplest method of applying the sulphuret or bi-sulphide, is by making three holes, two or three feet deep, around the foot of the Vine, then quickly pouring in the liquid and plugging them up. The holes may be made by a pointed bar driven by a maul. About two ounces of the liquid to each of these three holes are recommended. Soon after the announcement of this method, I employed it as a test on three Vines which I knew to be infested with Phylloxera, using 3 ounces to the first, 6 ounces to the second, and 9 ounces to the third—the soil being a light clayey loam. At the end of twelve days I found plenty of living lice on the first and second Vines, and such were found long afterwards, though in small numbers up to the time of the freezing of the ground. On the third Vine all the lice were evidently charred, but the Vine was also evidently injured, as the leaves wilted as though they had been scorched, though whether from the vapour issuing from the ground or from the injury to the root, it was impossible to determine. I think, however, from the former, as the larger roots were yet alive late in the season, and the Vine seems at this writing to be living. After very careful and laborious experiments made in France at different points and on different kinds of soil, by a commission especially charged with studying the action of this chemical, under the method proposed by Messrs. Monestier, Lautand, and d'Ortoman, it fails to fulfil the sanguine expectations of these gentlemen. The liquid is costly, its application is laborious, and there is great difficulty in reaching and killing all the lice without injuring the Vine. Great caution must also be had in its use, as it is extremely volatile and explosive—the vapour igniting at a great distance from the vessel containing it. While, therefore, not very satisfactory results have followed the use of pure insecticides, the application of fertilisers intended to invigorate the Vine and at the same time injure the lice, has been more productive of good. Especially has this been the case with fertilisers rich in potassic salts and nitrogenous compounds, such as urine. Sulphuret of potassium dissolved in liquid manure; alkaline-sulphates, with copperas and Rape seed; potassic salts, with guano; soot and cinders, are, among other applications, most favourably mentioned.

Why the Insect is more Injurious in Europe than America.

Without going into particulars, several good reasons may be given to explain the fact that Phylloxera is more devastating in the Vineyards of France than in our own. There exists a certain harmony between the indigenous fauna and flora of a country, and our native Vines are such as, from their inherent peculiarities, have best withstood the attacks of the insect. The European Vine, on the contrary, succumbs more readily, not only because of its more tender and delicate nature, but because it has not been accustomed to the disease; there being, doubtless, a parallel between this case and the well-known fact that diseases which are comparatively harmless among peoples long accustomed to them, become virulent and often fatal when first introduced among those that have been hitherto uncontaminated. Then the particular natural enemies of the insect which belong to its own class, and which in this country help to keep it within due bounds, are lacking in Europe; and it will require some time before the closely allied European predaceous species will prey upon and check it there to the same extent. The Phylloxera will, also, all other things being equal, have an advantage in those countries where the mildness and shortness of the winter allow an increase in the annual number of its generations. Finally, the differences in soils and in modes of culture have no insignificant bearing on the question in hand. Though Phylloxera, in both types, is found on our wild Vines, it is very doubtful if such wild Vines in a state of Nature are ever killed by it. With their far-reaching arms embracing shrub and tree, their climbing habit unchecked by the pruner's knife, these Vines have a corresponding length and depth of root, which render them less susceptible to injury from an underground enemy. Our own method of growing them on trellis approaches more nearly these natural conditions than that employed in the ravaged French districts, where the Vines are grown in greater proximity and allowed to trail on the ground, or are supported to a single stake. Their soil is also, as a rule, poorer than ours. One other important fact must also be taken into account in this connection, as it throws new light on the rapid spread of the disease in France. We have seen that from the middle of July to the end of the growing season the winged females are issuing from the ground, and scattering far and near to other localities. When we reflect that a single quart bottle, filled with roots taken from an infested Vine in August will furnish daily, for two or three weeks,

upward of a dozen such winged females, we gain some idea of the immense numbers supplied in the course of the year by a single acre of infested Vines. Last August M. J. Lichtenstein announced the discovery that these winged females congregated on a species of Scrub Oak (*Quercus coccifera*) for the deposition of their eggs, and while, as I predicted at the time, the insects he discovered proved to belong, for the most part, to Oak-feeding species of *Phylloxera*; yet, as he assures me, he is still convinced that he also found a certain proportion of the Grape species upon such Oaks. This I can the more readily believe because I have myself beaten from our Post Oak a large species which cannot possibly live on Oak, but which forms a gall on Hickory. The winged female *Phylloxera* is, therefore (and I know such to be true, in a measure of *Pemphigus* and *Eriosoma*) not drawn by instinct to any particular plant, but is wafted about, and will lay her eggs, or, in other words, deliver herself of her progeny, wherever she happens to settle. If this be upon the Grape Vine, well and good—the young live and propagate; if upon other plants, they perish. We thus have the spectacle of a species annually wasting itself to a greater or less extent, just as in the vegetable kingdom most species produce a superabundance of seed, the larger proportion of which is destined to perish. Thus, in the thickly-planted Vine districts of France, few winged insects would fail to settle where their issue could survive; while, in America, an immense number annually perish in the large tracts of other vegetables intervening between our Vineyards.

The American Oak *Phylloxera* (*P. Rileyi*).

There are several described and undescribed species of *Phylloxera* in this country, most of them inhabiting leaf-galls made on our different Hickories. The species herewith figured is the only external feeder known in America, and is briefly alluded to in this connection showing that, as with the Grape *Phylloxera*, it does not need a "winter egg" to enable it to hibernate, but passes the winter in the larva state (as at fig. 18), firmly attached to the tender bark of the younger twigs, and thus braving all the vicissitudes and inclemencies of that season. In the summer it is found on the under surface of the leaves of the White and Post Oaks, in the wingless female state of all sizes. Soon after it is born it inserts its beak into the leaf-tissue, and becomes more or less stationary. It causes no swelling of the leaf, but a yellow circular spot (fig. 17, *d*) somewhat larger than its own body and showing most plainly on the upper surface. The eggs are laid singly round the louse, and the process of parthenogenetic reproduction goes on for several generations, as in the Grape *Phylloxera*. By about the end of August, when these lice and their eggs are often very numerous, and when the speckled and often withered appearance of the leaf easily betrays their presence, the winged individuals begin to appear. This species is at once distinguished from all other American species, so far known, by its slender form and small size, but particularly by the long tubercles of the larger apterous individuals, and of the pupæ (fig. 17, *a*). Otherwise it greatly resembles the Grape *Phylloxera* in colour, and in the different forms it assumes. In habit and general appearance it very closely resembles the European Oak *Phylloxera*; but differs remarkably in its winter habit from what has hitherto been recorded of this last species, in that the last hatched larvæ in the fall fasten themselves to the more tender Oak twigs, where they rest till the following spring, with scarcely any change except in the deepening of the colour, which, as in the young Grape *Phylloxera*, hibernating on the roots of its food plant, becomes deeper and acquires a yellowish, or even a reddish-brown, tint. As the leaves begin to put forth, our young Oak *Phylloxera* cast off their winter skin, and their lethargy with it. They may then be seen crawling up and down the twigs, but do not settle on the leaves.

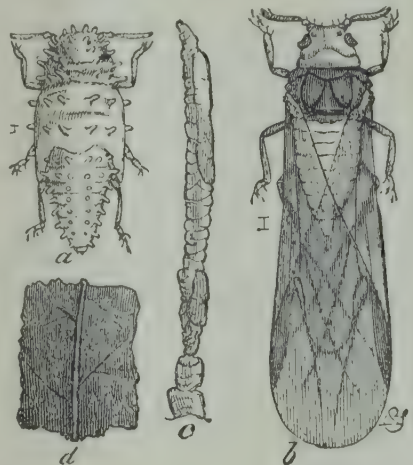


Fig. 17. *Phylloxera Rileyi*:—*a*, pupa; *b*, winged female; *c*, antenna greatly enlarged; *d*, portion of infested leaf, underside.

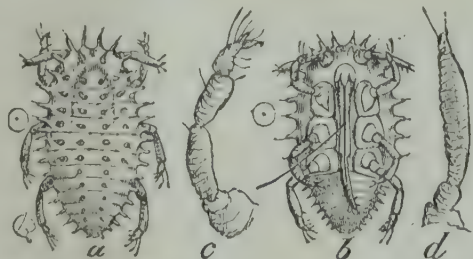


Fig. 18. *Phylloxera Rileyi*:—*a*, *b*, dorsal and ventral views of larva as seen hibernating; *c*, *d*, highly magnified leg and antenna of same.

Attaining, in a few days, full growth, they begin a virginal reproduction by covering the twigs with eggs, which hatch in about a week if the weather is warm and propitious. Thus the hibernating lice acquire their growth, and give birth to the first generation, in the short space intervening between the opening of the buds and the full growth of the first leaves. Beyond this I have not yet traced the vernal history of the species. Several parthenogenetic generations then follow each other until the winged females begin to appear early in July, when from them are born the sexual individuals, just as with the Grape Vine, and the European Oak species. With the drying of the leaf in fall the young lice congregate on the twigs, and the older ones perish.

GARDENING FOR THE WEEK.

Hardy Flowers, Alpine Plants, and the Wild Garden.

How to Plant an Herbaceous Border.—Having arranged (see p. 98) where the herbaceous border is to be, and how it is to be made, the next point is, how it is to be planted. Let us presume that the border is 8 or 10 feet wide, and that it will admit of four or five rows of plants. These individual rows must, of course, be graduated to some extent, according to height, though, in this respect, a considerable amount of variation will be advisable compared with the effective distribution of the contents of one of our regular floral ribbon borders; and I may further say that not a little of the interest and beauty of such borders depends on this variation. Sameness is the marked characteristic of the one, whereas diversity and individuality is that of the other. In this variation we have really one of the happiest coincidents in the formation of a border of this sort, as we are not governed by any fixed laws, nor are we obliged to exclude plants that may, by their nature, claim a wide diversity of development under different conditions and circumstances. Admitting, however, that diversity and individuality are the all-important points of an herbaceous border, there ought and must, indeed, to be effective, exist a certain prevailing tone of regularity—both as regards colour and development—something to indicate that the elements which Nature has so amply provided have been turned to the best and most effective account. In planting an herbaceous border the chief points to be studied resolve themselves into three, viz.:—colour, height, and season of blooming. Now the first of these is, in general, easily and correctly ascertainable from books and catalogues, and the broad principles that govern taste in the arrangement of colours being pretty well understood, I need not dwell upon this, except to remind my readers that along with colour the season of blooming must be taken into account, as a blue spring flower will not in the least interfere with a summer flower of the same colour, much less with an autumnal one, if they are placed side by side. As regards height, the matter is not so easily settled; true, the same catalogues give information upon this point also, nor is it any fault of the compilers if their information be not always correct. Amongst herbaceous plants I have seen the same identical species growing 4 feet high in one garden and 9 feet in another, the difference arising, to some extent, from the character of the soil, but more especially from that of the sub-soil. Then, again, a plant may attain an unusually great height the second year after planting in a newly-formed border, but will in a year or two revert to its normal development as the soil becomes exhausted; hence any local exuberance of growth as to height must be dealt with by placing such a plant a rank or two further back in the border. Let it, however, always be borne in mind that too much regularity in height will lead to a formality which ought to be absent from the herbaceous border. As to the season of blooming, though certain variations in respect of the seasons themselves, as well as the local peculiarities of climate, may cause considerable alteration, the main point to be aimed at is to distribute the plants that represent the seasons in the broad recognised sense of spring, summer, autumn, and winter, over the entire length of the border. If this be not attended to, half a dozen autumn flowers may be placed together, rendering one portion of the border gay at the expense of the remainder. The same remark equally applies to the plants of any other season. I have in the outset stated that, in all herbaceous borders, there ought to exist a certain amount of regularity, with a view to distant effect. This can easily be obtained, without by any means interfering with that variety of material, both in flowers and foliage, which give a special interest to the close observer. How this may be attained one or two examples will readily explain. Take the first rank; every one is familiar with the carpet patches of purple and white formed by the *Aubrietia* and *Arabis* in early spring. Now, if these are planted alternately and equidistant—say 12 feet apart—along the border, they will give all the effect of regularity, and yet leave

plenty of space between for other dwarf-growing plants. Take, again, for the third rank, such a plant as the fine garden variety of *Lythrum*, which continues in bloom for at least three months, and alternate it with the beautiful white autumn-flowering *Anemone Honorine Jobert*. The former I select, as a plant of taller growth, to stand well above the general height of the row. Let these be planted at distances of 15 feet apart, all along the border, and they will give all the regularity requisite. In the fourth row, the tall bright yellow *Achillea Eupatorium*, with its pretty Fern-shaped foliage, may do duty alternately with one of the tall-growing *Larkspurs* planted at similar intervals, or, perhaps better still, with the *Macleaya cordata*, whose lovely foliage is suffused with a rosy hue, as though it were continually reflecting the glories of the setting sun. For the back row, you have your *Hollyhocks*, your *Polygonum Sieboldi*, and some of the tall autumnal *Asters*, which may be so arranged as to present that continuity which ought to make itself visible all along the border. These plants I have selected as continuing in bloom for a long period and for possessing certain points that peculiarly adapt them to the purpose. There are many others. I merely use these as an illustration of the mode of carrying out the principle. I wish to establish a principle that I think is too often lost sight of. The time for planting is now fast approaching; but if, as is generally the case, your plants are in pots, my advice is not to be in a hurry; give your border plenty of time to consolidate; the end of March or beginning of April will be soon enough. If the plants are in pots, carefully disentangle the roots as you plant; this operation, though perhaps a little tedious, will sometimes save a season; and, above all, be not too sanguine about the success of your newly-formed border the first season, but remember that there are some herbaceous plants that will take two or even three or four years to recover a removal; and, further, that those plants usually live the longest and are the most valuable—in illustration of this you may take any of the tall-growing *Gentians*. I mention this, as many people used to the rapid growth of our bedding plants are too apt to expect the same from their herbaceous plants, whereas the latter are to last for as many years, or terms of years, as the former do months.—J. C. NIVEN.

Flower Garden and Pleasure Grounds.

Owing to the cold and sunless weather which has prevailed during the first half of this month, the growth of spring-flowering plants and bulbs has been considerably retarded; and in some instances a slight protection may have been found necessary, especially as regards early bulbs and other spring-flowering plants, and such shrubs as the *Chimonanthus* and *Jasminum nudiflorum*, early-flowering scarlet *Rhododendrons*, &c. As soon as a favourable change in the weather takes place, such protections should, however, be removed. When fine weather has set in, lawns should be again well swept and rolled; Grass edgings to walks should be lowered where necessary, and rendered solid by being well beaten down with a turf beater, and immediately afterwards they should be neatly and carefully edged. Finish, as soon as possible, any new work or alterations which may be in hand; and during frosty weather turn frequently the compost heaps, which should be in preparation for the flower beds and borders, and which should be ready to be applied as soon as the bulbs and spring-flowering plants are removed from them. If not already done, prepare beds for *Ranunculuses*, by removing the soil to the depth of 18 inches or more, and if the situation is in any degree damp, put in the bottom 4 or 5 inches of some rough material to act as drainage, such as brick-bats or lime scraps, and on this place some sods or litter to prevent the soil from mixing with the drainage; on this should be placed a portion of sound maiden loam and well rotted hotbed manure or dried cow-dung, together with a portion of the original soil; this should be, to some extent, incorporated together without, however, bringing the loam and manure to the surface. When the soil has become well settled, drills not exceeding 2 inches in depth should be drawn some 5 or 6 inches apart, and the roots should be placed in the bottom of the drill with their claws downwards, and pressed gently down at a distance from each other of about 3 inches; if the soil is at all heavy, the roots may, with advantage, be slightly covered with a mixture of finely-sifted leaf soil and sharp river sand. The drills should now be filled, in pressing the soil gently down with the hand and raking the surface of the bed smooth and level. Top-dress *Pinks* and *Pansies* in beds, and fill up any vacancies which have occurred. Let bedding *Pelargoniums* of all sorts, which may have been inserted as cuttings round the sides of pots some 5 or 6 inches in diameter, be now potted off singly; and, if possible, they should be placed in some situation where they can have the advantage of artificial heat until they have become somewhat established in their pots; they may then be placed in cold pits or in any other position where they can be protected from frost. The

variegated and tricolor sorts should be treated in the same manner; but, as they are more tender than the green-leaved or zonal kinds, they will require more care. Single plants of these sorts, in small or 3-inch pots, may with advantage be shifted into pots of larger dimensions in order to have the plants of considerable size when planted out. Cuttings of trees and shrubs of various kinds, such as *Poplars*, *Willows*, *Privets*, &c., should now be put in; while *Limes*, and other kinds of trees, which are usually increased by means of layers, should, when well rooted, be separated from the stools, and the roots should be carefully trimmed and planted in nursery lines, as should also the one year's seedling forest trees of various kinds. Prepare clay for grafting, and take off scions of ornamental trees and shrubs which it may be intended to increase by this means, such as those of the *Acer Negundo variegatum*, variegated *Elms*, and weeping trees of various sorts. Place the end of such scions in the soil in a shady situation in order that they may keep fresh until the sap is fairly in motion in the stocks on which they are intended to be worked, an operation which should be performed about the middle of next month.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Indoor Fruit Department.

Vines.—Pot Vines swelling their fruit should be liberally supplied with manure-water at every alternate watering. This has a beneficial effect on the swelling of the berries; and so has a thick top-dressing of manure. For this purpose, half-rotten cowdung is best, and when the pots are too full of soil to admit of much manure being applied, it may be built up, in the form of a cup, a few inches above the rim—a shape which will admit of water being given. If the fruit is wanted before it is likely to be ripe with ordinary forcing, the heat may be increased 5° or so. When the fruit and wood are fairly formed a little extra heat has not the same weakening effect as it has when given previously to their having attained that stage. Every favourable opportunity should be taken to admit fresh air to all growing Vines, shutting up early in the afternoon. A temperature of 80° is not too high at this time. Continue to pinch and tie the shoots, and to thin the fruit, as these operations become necessary. A genial moist atmosphere has a beneficial influence on all young growth, and has at the same time a tendency to keep down insects. In dull weather the foliage should not be syringed. Damping the pathways and keeping the evaporating pans full will be found to produce sufficient evaporation. Probably Vines that have been cut back may not start simultaneously into growth; each plant must, therefore, be lifted out of the bottom-heat in which it is growing, when the height (18 inches) previously recommended has been attained. As soon as a few roots have been formed, keep the temperature well up about Vine eyes, and, until the pots are well filled with roots, keep them rather dry than otherwise.

Pines.—As regards these, a general shift will shortly be necessary, and then the ball of every plant should be examined in order to ascertain in what state the roots and soil are. It is desirable to have the roots in a healthy-growing condition at the time of shifting, and, when the soil is not much exhausted and is well filled with roots, the ball will not require reducing while potting. These should now have a copious watering, as this is the last they will get until they have rooted into fresh soil. The soil in which Pines are to be potted will be benefited by an occasional turn over, and fresh plunging material should also be secured. Where leaves are used for this purpose, they should be turned where they are stored a week or ten days before they are removed to the Pine bed. Unless on extremely cold nights, the temperature in which Queens in fruit are placed should not be lower than 70°, and 15° above that is not an excessive heat at shutting-up time on a mild sunny day. Remove all the small gills and little sucker-like growths as soon as they appear around the base of the fruit.—J. MUIR.

Fruit Rooms.

Apples and Pears are now getting scarce, and as many weeks must elapse ere any considerable quantity of fruit will be available for dessert, increased care should be exercised to prevent decay. The stores should be examined at least once each week, clearing out all rotten fruit, and any that is even partially decayed should be at once sent to the kitchen for immediate use. Ventilate freely for a couple of hours every day, when the state of the atmosphere permits, remembering that rain, fog, or damp of any kind, and also keen frosty air, should be scrupulously excluded. On some kinds of Pears, through the wet season, mildew has been troublesome; the best remedy I have yet found is to gently wipe each fruit with a dry cloth, which is not nearly so formidable a task as it may be thought, as a handy boy will do several hundreds in a day. *Easter Beurré*, *Joséphine de Malines*, *Ne Plus Meuris*, and *Bergamotte d'Espéren* we are now sending in for dessert, all of which are in a good state of preservation and of super-excellent quality. *Beurré Rance*, at one time considered a fine dessert Pear, has in this

district been placed amongst those for stewing, of which it is one of the very best; but this season it is equal to the best dessert kinds, showing conclusively how dependent, as regards quality, all fruits are on the character of the summer and autumn. The best dessert Apples now in are Newtown Pippin, Pitmaston Russet, Sturmer Pippin, Court of Wick, and Ashmead's Kernel. Kitchen Apples now in use are London Pippin, Northern Greening, Wellington, Rymer, and Bedfordshire Foundling. If it be desired to keep for a length of time any particular kinds of Apples or Pears, they should be wrapped separately in tissue paper, and placed in air-tight drawers or boxes. By this means I have known Apples preserved for a whole year. Grape rooms are not yet so common as they ought to be, and will assuredly become, as soon as the merits of preserving Grapes in bottles of water is better known. The whole of our Grapes were cut five weeks ago, and I have to-day (February 13th) looked them closely over, and out of some 200 bunches, I have cut out, perhaps, a score of bad berries, certainly not more, although it is a fortnight since they were last looked over. Had this quantity of fruit been hanging on the Vines, we should, in addition to firing, airing, &c., have had to examine them almost daily, and probably cut away six times the quantity of mouldy berries, keeping out of the question the fact of the Vines being at rest, and the house available for bedding plants, &c. The Grapes should be cut with a portion of wood attached (the longer the better) and inserted in bottles of water, fixed in a slanting position, so as to allow of the Grapes hanging clear of them. The wood in front of the bunch is, for the sake of neatness, frequently cut off, but this practice should be discontinued, as it retards the circulation of sap. The difference here last year was very marked between those bunches having the front shoot cut off and those upon which it had been left, the advantages being greatly in favour of the latter. Thorough ripeness is indispensable to good keeping, indeed, it is the one great secret of the system, and when, as I am sometimes, told of failures and asked how it is my Grapes keep so well, I invariably answer—because they are thoroughly ripened.—W. WILDSMITH.

Kitchen Garden.

Cauliflowers, wintered in frames, may now be planted out under hand-lights; it is almost impossible to make the land too rich for them. Station planting may be advantageously adopted if the land is not in first-class condition; mark out the stations or positions, where the hand-lights are to stand in rows, 4 feet apart, and 3 feet from each other in the rows. Dig holes about the size of the hand-lights, 18 inches deep; put a barrowful of manure in each hole and make the soil level; take the plants up carefully with balls, and put four plants under each light. Those plants put out in the autumn under hand-lights may be thinned out to four under each glass, and the thinnings planted elsewhere; dustings of soot round and about the plants will be beneficial, and abundance of air should be given on all favourable occasions. Cauliflowers may also be planted in trenches, and if some warm stable manure can be had, good early Cauliflowers may be obtained in this way. The trench should be 5 feet wide and 18 inches or 2 feet deep; and the width will admit of three rows being planted, one along the centre and the other two 1 foot from each side. In casting out the earth the highest ridge should be laid on the side from which the coldest winds blow. Warm manure, to the depth of about 1 foot, should be placed all over the bottom, and then covered with 8 inches of soil. When planted, the plants may be protected in cold weather by means of old lights, oiled calico, straw or reed screens, or, if nothing better can be had, Spruce or Yew branches; even Pea sticks laid across the trenches will afford a good deal of shelter. Planting in trenches is a good plan to adopt in dry soils, as a good opportunity is afforded for applying liquid manure. Peas and Beans that have been raised under glass may be planted out in the warmest and most sheltered positions that can be had. Select a calm day for the operation, and when the planting is finished lay a ridge of dry soil along each side of the rows; place sticks not exceeding 3 feet high to such kinds as Ringleader and William the First, and the trimmings from the long sticks might be used for such kinds as Gem and Tom Thumb. Although sticks may not be absolutely necessary for the latter, they are more productive when kept off the ground, and they will also afford considerable shelter. As a further precaution, Spruce or evergreen branches, about a foot high, may be placed on the windward side. Beans may be protected in a similar way. Clear off all old crops of Cabbages or winter Greens; manure and dig the land for Potatoes to be planted next month. Celery may be taken up carefully with the roots, as far as is possible, entire, and laid in thickly in ashes or old tan under a north wall. In such a position it will keep in good condition a long time, as it will be less influenced by a rise of temperature when it occurs, and the land may be prepared for the next crop, which will be well suited for Carrots or

Cauliflowers. Jerusalem Artichokes may be planted now at any time; although this is a crop that will grow in almost any position, like everything else it pays best with good culture. In heavy land draw drills 3 feet apart and 2 inches deep, place the tubers 1 foot apart in the drills, and cover with a hoe, drawing the earth from each side over them, so as to form a ridge about 5 inches deep over the sets. Sow a few Leeks of the Musselburgh or Ayton Castle varieties for early planting; also the early Ulm Savoy. Capsicums may be sown in pans in heat, as also Tomatoes. Cuttings may be taken from the latter when stock plants have been kept through the winter, as plants so raised generally come into bearing first. Successional Mushroom-beds may still be made up in the house, and, at the same time, also, a bed might be made up in an open shed in a north aspect. There is no occasion to wait for the beds to decline to 65° before the spawn is inserted, as the moment the heat falls below 90°, and is still declining, the bed may be safely spawned, and much time gained. Of course, beds in a cool place will require more attention to coverings in order that the temperature may be kept regular. Provide a good stock of Cucumber plants for frame and pot plants. Hot-beds that have been used for Asparagus forcing, and that have lost most of their heat, may be planted with Lettuce, Potatoes, or Carrots, or they may be turned over and fresh manure added and used for forcing other crops requiring more heat, and for pricking out Celery.—E. HOBDAV.

EXAMINATION PAPER FOR STUDENTS ON BOTANY.

By the INJUDICIOUS HOOKER.

1. Why is the Gardenia so called, since it grows, not in gardens but in ladies' hair and young swells' button-holes?
2. What is the difference between the Broccoli and the Cauliflower? Has it anything to do with that which exists between a crocodile and an alligator, or a solicitor and an attorney?
3. Distinguish between Venus's Bath, Venus's Comb, Venus's Hair, Venus's Fly-trap, and Venus's Looking-glass? What kind of flies are usually caught in *Dionæa muscipula*, or Venus's Fly-trap? Do not "detrimentals" often escape? What sort of ladies are fondest of the *Specularia*, otherwise known as Venus's Looking-glass? Is ugliness their usual characteristic?
4. There is a species of *Phalaris* known as Gardeners' Garters. Does it give its name to the Order of Knighthood conferred on those famous gardeners, Sir Joseph Paxton and Sir William Hooker.
5. Is the *Ormosia* or Necklace tree worth cultivating by jewellers?
6. *Atriplex*, *Anthyllis*, and *Plantago* are known as Lamb's Quarters, Lamb's Toe, and Lamb's Tongue. Mention the London butchers from whom they can be purchased.
7. Lady students are requested to give the Latin equivalents for Lady's Bedstraw, Lady's Comb, Lady's Cushion, Lady's Fingers, Lady's Garters [*Honi soit!*], Lady's Glove, Lady's Hair, Lady's Laces, Lady's Looking-Glass, Lady's Mantle, Lady's Nightcap, Lady's Slipper [ah, how long since Mr. Punch played "Hunt the Slipper"!], Lady's Smock, Lady's Thimble [true ladies are not ashamed of the thimble, though vain young lady minxes are], Lady's Tresses, and Lady's Thumb.
8. Classify with care the two unique species, *Gladstonia morosa* and *Disraelia gloriosa*.—"Punch."

Sunken Boilers.—I am astonished that these boilers have not been condemned long ago by your practical horticulturists; but I suppose that custom and routine are, in England as elsewhere, hard to break through. For my own part, I see no reason for burying the boilers. Why not use the portable upright slow-combustion stoves, like those made by Read, Deard, and others of your able constructors? That apparatus is here called the Thermostat thermosiphon. For the last ten years I have always used one. It is placed in a small room, which serves me as library and writing office. Next to it is another small room, which separates the office from my greenhouse, and the pipes pass through the two walls. My greenhouse measures 30 feet long by 12 feet wide, and the length of the 4-inch cast-iron pipes is about 160 feet. The house has not been covered this winter; and, although we have had some severe frost in December and January (8° Fahr. out of doors) the temperature inside remained above the freezing point. This apparatus has the advantage of being portable and economical, and of not requiring any fixing, and but little attention. Mine is about 3 feet in height and 1 foot in diameter in the interior. At night, about eight o'clock, I fill it with coke, suppressing nearly all draught, and the next morning, at seven o'clock, I find the fire still lighted. I always attend to it in the day, so as to have more heat than at night, although I see my neighbours do the reverse. They most likely have never observed that, even in the warmest climate, the nights are much cooler than

the days, and that plants want their night's rest as well as animals. I have learnt from experience that gas-coke is the best fuel for these stoves; but it must be broken, as regularly as possible, in small pieces about the size of a Walnut. If I could obtain coke without stones, I might light my fire on the 1st of October and keep it burning until the 1st of April. I now clean the apparatus once a week, and light the fire again. I expend coke to the value of 6d. in twenty-four hours. The price of coke here is 3s. 3d. per 200 lb. The draught of the chimney must be checked, and the coke must consume slowly to produce its effect. These stoves are particularly useful for amateurs who, like myself, attend themselves to their plants, but object to getting up at night to look after their fires. My opinion is that this apparatus ought to supersede all other methods of heating greenhouses.—JEAN SISLEY, Lyons.

The Artichoke a Remedy for Rheumatism.—In the "British Medical Journal" for December 19, Dr. Copeland, of Norwich, has published some cases confirmatory of a former paper recommending the treatment of rheumatism with the common Artichoke in the form either of tincture or extract. These are prepared from the leaves gathered just before the vegetable is fit for food, and whilst they are full of juice. If the leaves are left until the top is cut off for cooking purposes, and the plant begins to wither, the product is useless and inert. To this circumstance Dr. Copeland attributes the negative results met with by some practitioners.

Home-grown Tobacco for Purposes of Fumigation.—Ordinary Tobacco, as used by smokers, has undergone a certain amount of fermentation. In America, immediately after the plants are cut, they are hung upon lines stretched under open sheds to dry. When dry, they are next taken down, sprinkled with water, cast into a heap, and allowed to remain until a proper degree of fermentation is attained. The fermentation is then promptly arrested by again hanging them over the lines to dry. The above process is repeated two or three times in succession, when the leaves are ready to be packed for the use of the tobacconist. I am afraid, however, that home-grown Tobacco will be found to be totally useless for purposes of fumigation, manipulate how one will. I have repeatedly tried some grown in my own garden in the north of England, and have found it no better than the same amount of brown paper, owing to the non-formation of the poisonous essential oil—nicotine—in plants grown in these cool latitudes. I was myself puzzled to know the reason why our own tobacco should differ so widely in taste, smell, and effects from the ordinary weed, when tested in a pipe, and the microscope solved the mystery. For the benefit of those who may not be conversant with the subject, I may explain that the nicotine is alone secreted and contained in minute urn-shaped knobs, situated upon the tips of the hairs which thickly cover the epidermis of the whole plant—both stem and leaves; and that the peculiar effects of tobacco, either when smoked or used as a fumigant, almost entirely depend upon the presence of this principle. On submitting (says a writer in the "English Mechanic") a portion of sound Virginian Tobacco leaf, even after having undergone all the various processes of manufacture, to the microscope, these urns will be readily seen terminating the hairs. Now, on examining the plants grown in my own garden, I discovered that these capillary urns were almost entirely absent, with the exception of a few sparsely scattered at rare intervals upon the stem and under-side of the mid-rib of the leaves—due, no doubt, to the comparative coldness of the climate—although the plants were, in every other respect, vigorous and well developed, the hairs all over the leaves, with the exception named, terminating in sharp points, like needles, in place of urns. Hence the unsuitableness of home-grown Tobacco for ordinary uses.

PERSONAL.

GOLDEN SQUARE, we understand, is about to be remodelled by Mr. Bromwich, of 25, Buckingham Palace Road.—Mr. William Lewin, brother to Mr. H. W. Lewin, Drumpellier, succeeds Mr. Michael Gray at Aske Hall (Earl of Zetland's), from Upleatham.—Mr. McKenzie, of Alexandra Park, having nearly completed the outdoor works and glass structures there, is prepared to take commissions in landscape gardening and the improvement of landed estates. He will still continue on the official staff of the Alexandra Palace Company.—Mr. Smith, many years gardener at Exton Park, is about to take charge of the extensive garden establishment at Mentmore, the seat of Baron M. de Rothschild.

OBITUARY.

We have to record with much regret the death of Lady Cullum, at Hardwicke House, Bury St. Edmund's, on the 16th inst. Mr. Fish thus informs us of the suddenness of the sad event. He says, "Her ladyship was with me in the garden yesterday till three, and was in good health and spirits; but, after she went into the house, she was taken ill directly, became insensible, and never rallied." Lady Cullum was devoted to horticulture, and had a charming garden.

NOTES AND QUESTIONS.

[Many notes and answers, obligingly sent us by correspondents, are unavoidably omitted this week from want of room.]

Narcissus pachybulbos.—Some of your readers may like to know that this Algerian plant is now in bloom in Mr. Munby's garden at Alice Holt, Farnham, for the first time in this country.—H. HARPER CREWE.

Continuous-blooming Indoor Roses.—Can any of your correspondents give me the names of a few Roses that will bloom all the year round in a greenhouse?—T. O. R.

Grafting Magnolia Campbelli and Lenne.—When should I graft these, and which is the best stock to graft them on; also, how should I afterwards treat them?—G. H.

Orchid Baskets.—For the information of "Devonian" and others we may state that the rustic pottery-ware Orchid baskets alluded to last week (see p. 143) are manufactured by Mr. Matthews, of Weston-super-Mare.

What is the Maze Berry?—Can any of your readers tell me what this fruit is? A clergyman, who resided ten years in Jamaica, tells me it is the finest of the tropical fruits, and is produced by a small tree. Neither the "Treasury of Botany" nor "Lindley's Vegetable Kingdom" allude to it.—W. T., Ipswich.

Mistletoe Seed.—Can any of your readers assist me to some fresh Mistletoe seed? I should be happy to exchange seeds of hardy plants for it, or plants of *Pentstemon ovatus* and *speciosus*, *Aquilegia arctica*, *truncata*, or *Skinneri*, *Primula japonica* or *farinosa*, &c. Address, GARDEN OFFICE.—SALMONICEPS.

Large Persian Cyclamens.—We have received from Mr. Williams, Victoria Nursery, Holloway, some of the largest and best blooms of *Cyclamen persicum* we ever remember to have seen. They belong to the variety of *C. persicum* called *giganteum*, a name which they well deserve, being not only in substance but in size a great improvement on the ordinary type.

Planting Large Camellias in Conservatory Borders.—We are thinking of making a border in our conservatory (doing away with the old shelves), and planting in it old plants of Camellias. Will some of your readers tell me what is the best time to do this, and whether or not it would be best to shake all the old soil from the roots or simply open the balls with a stick?—N. H. P.

Iris reticulata Indoors.—I have this now in bloom in a pot from bulbs potted up in November. Thus it blooms almost as early as *Scilla sibirica*, and simultaneously with *S. bifolia*, grown in a cold house. It is seldom met with, notwithstanding the beautiful flowers which it produces in a cool house or frame at this very early season. Its flowers reach to a height of 6 inches, are of a rich bluish-purple in colour, with bright orange throat, and would be very effective in bouquets or in ladies' hair. It is one of those early hardy bulbs that all should grow.—A. D.

Vine and Peach Destroying Maggots.—I have sent you some maggots, and a specimen of their work on Vine and Peach tree roots. They are very numerous. Could you inform me what they are, and what will kill them without damaging either the Vine or the Peach. In the case of the Vine, the maggot eats the roots, and, in the weevil state, ascends and eats the young shoots.—THOMAS BOYD. [This is the larva of an *Otiorynchus*, possibly *O. sulcatus*, but more probably some other species. If our correspondent would breed some of the larvæ, and send us the perfect insect, it would be very desirable.—A. M.]

Winter Broccoli.—It is sometimes recommended that late Broccoli should be planted thickly, in order that they may shelter each other during severe weather. This is a mistake; the destructive effects of the late frost will afford a very useful lesson in this respect. Thick planting encourages weak soft growth that soon succumbs to cold, but where the plants have stood 3 feet apart, or even at wider intervals, the growth is dwarf, firm, well matured, and in a better condition, generally, to resist extreme cold. Being dwarf, a covering of snow affords greater protection, and the loss, consequently is trifling.—E. HOBDAY.

Psidium.—This name is now appearing in various mediums for advertising, and has already elicited some speculation as to its pronunciation and meaning. It should be pronounced *Psidium*, by no means *Psidi um*, as some suppose; and is the name given by botanists to a genus of which the Guava is the best known representative. The title owes its present prominence to the fact that it has been chosen by Messrs. Piesse & Lubin, of New Bond Street, as the designation of a new perfume which they are about to issue, and which is likely to become as popular as the "Opoponax" with which the same firm puzzled people in general a few years back.—B.

Zinc Garden Labels.—We have received from Mr. Yeats, of Willow Cottage, Mortlake, specimens of zinc labels, light and neat in shape, and of forms suitable for pots, walls, or for suspending from Standard Roses or other trees. The latter are fixed to the tree by means of stout leaden wire passed through two holes in the label, which is thus firmly held in a readable position, and at the same time secured in a double manner to the tree. On samples of these labels, exposed to all weathers since 1868 and 1870, the names are as legible as when first written. Labels of this kind are cheap, durable, and the ink apparently indelible.

Great Scotch Firs.—Few are aware that this tree attains such proportions as it does in many places in the north of Scotland. On referring to the forest of Glenmore I find I did not give the dimensions of the skeletons still standing there denuded of bark; the boles of many of these measure above 20 feet in circumference. There is even now in Scotland many fine Firs likely to attain these dimensions. At Dornaway Castle, the seat of the Earls of Moray, there is a noble tree of this description of Fir 15 feet in circumference, and 50 feet in height without a branch. At Inverary Castle, too, there is a tree 115 feet high, with a circumference of 13 feet 6 inches at 3 feet from the ground.—J. T.

Grafting Walnuts.—How can a remarkably good Walnut be propagated?—H. MEADE-KING. [In the climate of England, and even in that of Paris, I only know one method of propagating the Walnut with any chance of success. This is by grafting, or by inarching. By means of cleft-grafting, whip-grafting, and crown-grafting, I have sometimes succeeded, but seldom in proportion to the number of trials. The difficulty felt here in propagating the Walnut by grafting arises from the fact that the wood of the grafts is not sufficiently ripened. In the south-east of France, where the summers are hotter, and where Walnuts are an article of extensive commerce, an ordinary operator succeeds in fifty cases out of a hundred, and it is whip-grafting that is most frequently practised, but flute-grafting is also employed. These remarks wholly apply to open air culture. There is also a chance of succeeding with the Walnut by means of plants cultivated in pots, which are grafted in the spring under cloches, very much in the same way as *Rhododendrons*, *Oranges*, and numbers of similar plants; but, by this plan, one ought to be satisfied with very moderate success.—F. D. JAMIN, Bourg-la-Reine.]

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

GRAPE GROWING IN THE OPEN AIR.

ONE cannot read of the system of Grape culture pursued by the French in the vicinity of Paris, which is fully described in "The Parks, Promenades, and Gardens of Paris," and also by the late Mr. Thompson, of Chiswick, without coming to the conclusion that their success is largely due to French thrift and industry. Their methodical way of training the Vines so as to cover every inch of wall surface, and enable them to calculate exactly the number of bunches to be had from a given area; their painstaking system of pinching the shoots in order to regulate the vigour with the utmost nicety throughout the whole tree; their cheap and expeditious manner of thinning the berries; and their somewhat primitive but effectual protective and other appliances, remind one of the thrifty and plodding Chinese agriculturists we read of, and indicate a settled and profitable industry handed down from sire to son, with little or no change, for generations. Mr. Thompson states (p. 676 of the "Gardener's Assistant") that as many as 320 bunches can be produced on a surface little more than 8 feet square. Of course the bunches are only middle-sized; but what a quantity! Is any such instance of systematic heavy cropping under glass even on record in this country? Mr. Thompson was a conscientious writer, and not likely to exaggerate in such a case. The same authority also states that the training and stopping of the shoots is conducted so methodically, and with such periodical regularity, that the quantity of foliage on each plant is, year after year, almost uniformly the same. Both plants and shoots, too, are restricted to a limited space, but apparently restriction produces none of the ill effects usually ascribed to it. No doubt the Thomery Grape growers have some advantage so far as climate is concerned, but not much in mean temperature, at all events. Possibly a rather more constant sunshine constitutes the only real difference in this respect, and it would be unfair to credit this advantage with more than a fractional part of the success which is attained. We must, I think, rather attribute it to that faculty which the French possess for turning circumstances to the best account, and for making the most of trifles—a faculty which often enabled the French soldier, in the dark days of the Crimean expedition, to extemporise a dinner or a salad out of a few materials, when his English comrade had to go without; and the same power of adapting means to ends is said also to constitute the difference between an English cook and a French one. The fact exists, at all events, that Grapes of fair quality can be grown out of doors in England; but since Vineyards disappeared instances of anything beyond a slovenly attempt at out-door Grape culture are exceedingly rare, and yet many a proprietor and cottager might make it not only a source of pleasure, but of profit. Local horticultural societies might accomplish practical results in fostering Grape culture with the class among whom they seek to encourage a love of gardening. I can personally testify that the system of offering small prizes for the best kept gardens, adopted on some gentlemen's estates, is attended with the very best results. I speak within the truth when I say that some of the best cropped gardens, best vegetables, and best hardy fruits I have ever seen, belonged to cottagers who were encouraged in this way. The prizes were almost nominal. The "honour of the thing," and the prospect of receiving a kind word of approbation from the squire, soon came to be the ruling motive among the competitors. It has often been difficult to determine, in our own experience, who deserved a prize; but a word of commendation or praise, or a mere exhibition of interest in any special feature deserving of notice, never failed to stimulate and encourage to still greater exertions. Now I would suggest some effort of this kind in those districts where there is a probability of Grape culture succeeding. The Vine is easily propagated, and those who are disposed to assist their cottagers and neighbours need be at no further expense than is entailed by striking the Vine cuttings and giving

them away. Unfortunately, modern writers on the Vine have not generally contemplated its culture in the open air in England among the humble and rural population, and, while their teaching has been adapted to the purposes for which it was intended, it has undoubtedly had a tendency to create an impression among the uninitiated that Vine culture was an awful mystery. It is well, therefore, to state here that the Vine, though it does not ripen its fruit in some parts of Great Britain and Ireland, is perfectly hardy, and, wherever its wood attains sufficient maturity, it is one of the most certainly prolific fruits with which we are acquainted. It will also thrive well in any ordinary garden soil that is generally suitable to common vegetables; but its vigour and fruitfulness will of course depend upon the cultural treatment it receives. Further, it is easily trained, grows rapidly, and begins to bear fruit at an earlier age than almost any other hard-wooded fruit tree. In short, it may be said that the chief obstacle to Grape-growing anywhere in England is the ripening of the wood. Whenever the summer shoots get brown and tolerably hard by October or November a crop of fruit is ensured; and this ripening is a question of summer heat and summer pinching and training. The French growers are, it appears, satisfied if the base bud on each shoot, to which they cut back in winter, is thoroughly ripened; and that this much and more can be secured in many parts of this country, against walls and cottages, with the earlier kinds of Grapes, is a fact beyond dispute. It is important to note this; for, as a rule, the annual shoots of the Vine ripen contemporaneously with the fruit, and where the one ripens the other will. Having said this much in order to remove some very prevalent but false impressions concerning the Vine, I may give a few practical hints on culture. Though the Vine was formerly grown in the open ground, espalier fashion, in this country (an argument which should surely encourage us to expect some success against walls now), I am not going to recommend the practice here. Whoever has got a wall, however, or, what is better, a warm house-front or gable end, facing to any point between south and south-west, may attempt Grape culture. Possibly, a line drawn across the country about the northern limits of Nottinghamshire or Lincolnshire would represent the northern boundary within which success might be expected, though, doubtless, there are many favoured nooks much further north where Grapes might be ripened. The Black Hamburgh is not by any means the earliest Grape, and consequently is not suited for out-door culture everywhere; but I have seen it ripen its fruit on the front of a cottage about Worksop, where it was trained intelligently by the proprietor. I have also seen fairly finished bunches of the same variety grown against the chimney stack of a forcing pit as far north as Dumfriesshire. About London and further south no doubt such instances are numerous. On the sloping roof of a tiled house in Kent a friend of my own had an old Vine that regularly ripened a quantity of Grapes, though it certainly did not receive the attention it deserved. As the Vine, when grown out-of-doors, is not likely to grow so luxuriantly as under glass, and as it is not desirable that it should do so, the border need be neither so deep nor so rich as Vine borders are usually made. Good ordinary garden soil, such as is found to produce fair crops of such vegetables as Peas and Potatoes, and in which other fruit trees grow well, will do. If chopped turf can be had to mix with it, all the better, especially if the soil be light; or, if it be old, kitchen garden soil in which humus has accumulated. If it be heavy, well-rotted stable dung and leaf mould may be added in considerable quantity, and in either case bones or bone-dust will repay application. The border need not be above 12 feet wide, and, I need hardly say, it should be well drained. It should slope to the sun more than fruit-tree borders generally do; and, in order that the sun's influence may be felt on the Vine-roots, it should not be more than 18 inches deep. Some sort of trellis should be provided for training the Vines against the wall. This may be either of wood or wire; the latter is most convenient, and, as the wires can be stretched by anybody, it is not expensive. Whatever material be used, the supports should be stretched horizontally 18 inches apart, and about 3 inches from the wall. These directions are also applicable to house fronts or cottage ends—only that, where but one or two Vines can be accom-

modated, a semicircular piece of ground, about 15 feet wide, will represent the border. In such situations the site is generally sufficiently drained, and, if the ground is deeply and regularly dug over, and enriched with any of the materials before mentioned, it will be in a condition for receiving the Vines. In another number I shall conclude by describing briefly the planting of the Vines, and the simplest and most methodical way of training and cropping, so as to get early and regular returns in the shape of fruit. J. S. W.

SULPHUR OFTEN THE CAUSE OF RUST ON GRAPES.

YOUR correspondent, "J. M." (see p. 150), says he does not believe that sulphur fumes have any influence in producing rust. I confess to having been somewhat startled on seeing such an assertion made by one who is looked to as an authority in such matters. Sulphur itself may be used in any quantity in a house at whatever stage the Vines may be in, without the least injury, provided it be used so as not to come in contact with any heated surface, such as pipes, flues, &c. I have used it repeatedly for prevention of mildew by mixing it with water and syringing it on while the foliage has been in a tender state, and before the bunches have been in bloom, immediately after they were set; and, indeed, in all stages as occasion required. It is only when applied to surfaces that become heated that any danger is to be apprehended, and only then when it becomes sufficiently heated for the fumes to contain sulphuric acid gas, one of the most deadly known to vegetation, as may be seen in the destruction that occurs near large works evolving this gas. That sulphur fumes will produce, and are more frequently the cause of, rust on Grapes than anything else, is a fact known to most gardeners, and many have had to lament the incautious use of it for the purpose of eradicating red spider; I would therefore warn your readers of the risk they run by having sulphur on the pipes or other heating surfaces while the berries are small and tender, and the young leaves susceptible of injury by a little overheating at that critical time. The skins of the young berries at setting, and just after they have set, are so exceedingly tender that a very small matter, such as a slight brush against them by the hair of the head of the person working amongst them; a rush of hot or cold air, or similar extremes; even their own pollen and portions of the flower hanging about them too long at setting time; have been known to cause rust, showing how exceedingly delicate and tender the skin is just at that time, and how imprudent it would be to have the air just then impregnated with sulphur fumes. After the stoning period is the safest and best time to apply sulphur to the pipes for the purpose of keeping red spider in check, and a Vinery must have been badly managed, indeed, if it is required before that time. As to the small bunches on the lateral shoots escaping, that may have occurred from their close proximity to the glass, or from shelter they may have received from the leaves or some other cause just at the particular time mentioned by your correspondent. At any rate, if "J. M." does not mind trying the experiment, he may soon have convincing proof that sulphur fumes are a sure cause of rust if allowed to circulate in the air of the house while the skin of the Grapes is tender and susceptible to injury of that kind. J. SHEPPARD.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

The Mazeberry (see p. 168).—This is doubtless the Jamaica Plum (*Sapota Achras*), commonly cultivated under the name of Naseberry. It is a native of Trinidad, but is cultivated throughout the greater part of the West Indian Islands. The fruits, when dried, are occasionally brought to this country, and are, to my thinking, very superior to French Plums.—J. TYERMAN.

Outdoor Peaches.—The Early Ascot is one of the best for open walls, being very hardy. Its fruit is deep red, large, tender, and well flavoured; it also forces well. Another excellent outdoor Peach is Marquis of Downshire, a mid-season or late variety. Its fruit is deep red, beautifully marked, large, tender, and melting. The tree is very hardy and forces well.—DAVID LUMSDEN, *Bloxholm, Sleaford.*

Knight's Monarch Pear.—Though by no means new, this is a Pear which should be in every collection. Its flavour is excellent; it is a good bearer, and it remains longer in season than any other variety. It began to ripen here on the 1st of November, and lasted in good condition for ten weeks. I do not mean to say that all the fruits were ripe in November, but one could always select a dish from them fit for the table. What I wish to state is that they do not ripen all at once like other varieties; I found this Pear to be the latest here, except Prince Albert, which with me is only fit for stewing. Knight's Monarch ripens well as a standard in favourable localities.—J. RUSK, *Tunbridge Wells.*

Ashmead's Kernel Apple.—We have received from Messrs. Wheeler, of Gloucester, specimens of this excellent Gloucestershire Apple, which is one of our best table varieties from November till May. It is a nutty, crisp, medium-sized Apple with a delicious flavour—better, in fact, than anything just now in Covent Garden Market. The tree, which in habit resembles that of a Nonpareil, is very hardy, and well deserving of cultivation.

NOTES OF THE WEEK.

—MR. J. SHERRATT, Knypersley, near Congleton, writes to us to say that the Mangosteen (*Garcinia Mangostana*) is now in flower there, and that the Kumquat (*Citrus japonica*) is also splendidly in fruit in the same establishment, in which it is bearing upwards of 460 ripe little egg-shaped Oranges, and forming a really beautiful object.

—FIFTY guineas are to be awarded in prizes this autumn by Messrs. Hooper, of Covent Garden, for the two Potatoes Snowflake and Eureka, the prizes to be divided equally between them. The conditions under which the competition is to take place will be found in our advertising columns.

—DR. MOORE, writing to us from Glasnevin, Dublin, says:—"We have had remarkably mild weather here of late, which brought out quite a blaze of spring flowers, but they were laid low by 5° of frost on Wednesday night. This climate of ours is unequalled in most respects, but very treacherous during the early spring months."

—MR. HOBDAY, Ramsey Abbey, Huntingdonshire, says, we had 11° of frost this morning (Feb. 24), and signs of more snow. Pears and Apricots are swelling their blossom buds; but all are as yet safe. Fruit prospects, judging from the well-ripened appearance of the wood, and the numerous blossom buds with which the trees are studded, look promising.

—WE hear, on good authority, that at a meeting of the Council of the Royal Horticultural Society, held this week, it was ordered that the prize money due to exhibitors for the past year should be paid. This will be welcome news to some of our readers who have complained to us about the matter. At the same meeting Sir Alfred Slade and Sir G. Chetwynd gave in their resignations.

—"A FINE collection of hybrid *Amaryllis* is now flowering in Messrs. E. G. Henderson's nursery at St. John's Wood. They are principally hybrids of the *A. pardina* section, and may be grown in a much cooler temperature than the ordinary kinds. One of the finest is "E. G. Henderson," a variety with a finely expanded flower, suffused and speckled with crimson-maroon, the segments being tipped with white. Many of these seedlings are strikingly beautiful, and will become exceedingly popular, being easily grown, and effective winter flowering plants.

—DR. MASTERS delivered a lecture, on Wednesday evening last, in the Council Room of the Royal Horticultural Society, at South Kensington, on "Charles Darwin as a horticulturist." He pointed out that Darwin, without being in reality a horticulturist, had, nevertheless, united the observations of gardeners with the researches of botanists in such a way as to enable him to build up theories with regard to cross fertilisation and natural selection of the utmost value to cultivators in their everyday practice. The lecture was illustrated with coloured diagrams and living plants.

—WE have received a flowering specimen of the dusky-coloured sweet-scented *Iris longifolia* from the Rev. J. T. Boscawen's garden at Tregoney, Cornwall, through the kindness of Mr. Tyerman, who remarks that it forms a useful companion to *I. reticulata*, *I. (Xiphion) Histrio*, and *I. stylosa*. *I. longifolia* is of a metallic purplish-green tint, something like that of the wing cases of the Rose beetle, while the tips of the outer segments are of a rich velvety brown. Irises are all, for the most part, easily-grown garden plants, and we are pleased to learn that their nomenclature has been carefully revised by Mr. Baker, who has already done such good service in that way in the case of other popular genera.

—MR. TYERMAN has sent us another charming collection of early flowers from Tregoney, comprising, amongst others, *Narcissus odorus*, *N. papyraceus*, *N. Tazetta* (*Hermione floribunda* of Jord. and Four., Ic.), a splendid large white variety, with clear lemon cups. The flowers of this fine form measure fully 2 inches across, the segments being an inch broad, and much imbricated, and from ten to twenty flowers are borne on a single scape. These were accompanied by a fine specimen of the Summer Snowflake (*Leucojum aestivum*), which seldom blooms until much later in the season. Mr. Tyerman informs us that a large, rich scarlet-flowered form of *Anemone coronaria* is now very beautiful in many Cornish gardens.

—WE reprint, elsewhere, an article from the "Saturday Review," on modern flower gardening. The writer, of course, has his fling at the gardeners, who, however, are by no means so much to blame as those who command or encourage them to follow the course he deprecates. Many a gardener, fond of plants, and with a good knowledge of them, received orders to follow the fashion and to pay no attention to older favourites. We are convinced that most gardeners would be pleased to reduce the "bedding display," as it is called; for it is the most expensive and troublesome mode of embellishing a garden; but it is for their employers to give the word. If some of the labour and expense devoted to the production of this ephemeral decoration were bestowed in permanently embellishing a different portion of the grounds yearly, it would be very much better for gardening and gardeners.

MONKSHOOD AND HORSERADISH.

CASES of poisoning so often arise from the roots of Monkshood being mistaken for those of Horseradish that we have thought it well to illustrate the two, with the view of pointing out the differences that exist between them. Professor Bentley thus directs attention to the characters by which they are distinguished in the "Pharmaceutical Journal":

Monkshood (*Aconitum Napellus*).—The root of this plant is a biennial. It is formed on the side of the root of the previous year during the summer and autumn, and the old root then gradually

Monkshood (*Aconitum Napellus*).

decays. About the months of October, November, December, and January, when the leaves are absent, it possesses the greatest activity, and hence the above months are the best time to collect it when required for medicinal use, and also that period in which its poisonous effects are the most intense. The time, therefore, when the root is most poisonous is that when it is alone liable to be substituted for Horseradish, for when the leaves appear the two roots are not likely to be confounded. In length the root of Monkshood averages about 5 inches, but sometimes it is as much as 8, or even 10 inches if grown in a very luxuriant soil. In form it resembles the cultivated Carrot, or more nearly the common Parsnip, being broad at its upper extremity and tapering gradually downward to a small thread-like point; the upper extremity, on an average, being about the thickness of the middle finger, but frequently an inch or more in diameter. Sometimes the main root divides into two or three divisions, each of which resembles the other. It passes perpendicularly into the earth, giving off from its sides numerous cylindrical fibres, about the thickness of a common knitting needle. In colour, externally, the main root and its fibres are coffee-coloured, or dark brown, or some shade of brown. Internally, it is white. It has no particular odour, being merely earthy. Its taste is at first bitter, but in a few minutes a very peculiar feeling of numbness and tingling is perceived in the lips, cheeks, and tongue.

Horse-radish (*Cochlearia armoracia*).—The root of this plant is a perennial. It is commonly a foot or more in length, giving off from its sides a number of irregular branches of variable sizes, and terminating frequently at its upper extremity in two or more divisions, from which the leaves arise. In diameter above it varies from about half an inch to 2 inches or more; as commonly used, it is about the thickness of the thumb. In form, it is enlarged about the crown, or point where the



Horseradish root.

leaves are given off; it then slightly tapers for a short distance, and becomes ultimately more or less cylindrical, and instead of tapering gradually to a point, as the root of Monkshood, it frequently maintains nearly the same thickness to its lower extremity, and then commonly divides into two or more branches. In other cases, however, it does taper somewhat from its upper to its lower extremity, but by no means, in any instance, so evidently as in the root of Monkshood. In colour, externally, it is white with a tinge of yellow, and whitish internally. Its odour, when scraped or bruised, is exceedingly penetrating and acrid, exciting frequently sneezing and secretion of tears. In taste it is very pungent, especially in autumn and spring, accompanied by a bitter or sweet flavour, according to circumstances; as, for instance, the season at which they are collected, the manner in which it has been cultivated, and the soil in which it is grown. The more important distinctive characters between the two roots may be thus tabulated and contrasted:

MONKSHOOD.	HORSERADISH.
Conical in form, and tapering perceptibly to a point.	Slightly conical at the crown, then cylindrical, or nearly so, and almost of the same thickness for many inches.
Coffee-coloured, or more or less brownish externally.	White, or with a yellow tinge.
Odour, merely earthy.	Odour especially developed upon scraping, when it is very pungent and irritating.
Taste, at first bitter; but afterwards producing a disagreeable tingling and numbness.	Bitter or sweet, according to circumstances, and very pungent.

The roots of Monkshood and Horseradish may be also distinguished by the different appearances they present when scraped with a knife. Thus, the former will then be observed to be of a succulent character, and the scraped portions soon to acquire a pinkish or reddish hue; whilst the latter scrapes firm and dry, and does not alter in colour.

From the above description of the roots of Monkshood and Horseradish, it will be seen that instead of resembling each other, as is commonly supposed, they have scarcely any appearance in common, presenting evident and well-marked distinctive characters in their form, general appearance, colour, odour, and taste. The only resemblance between the two roots, and this is but a slight one, is in the appearance of their crowns, but even supposing it possible to mistake them so far, the other characters of distinction are so well marked, that no difficulty ought to arise in distinguishing between them.

Crassula lactea a Good Plant for Winter Decoration.

This is a plant which is not so generally grown in gardens as one could desire, seeing that it flowers in the greatest profusion, even in mid-winter, in a cool greenhouse or window, for the ornamentation of both of which it has few equals. Small plants of it are, as a matter of course, comparatively ineffective, but, after they have attained size, so as to produce from sixty to eighty white star-like flowers on a plant, it becomes an object both attractive and striking. We have plants of it here three years from the cutting stage in 8-inch pots, that are each producing the number of blooms just mentioned, and which we found useful for the decoration of the conservatory, in which they are much admired. The culture of this succulent is so easy that nobody need experience any difficulty in the matter. It is readily propagated, and grows freely in sandy-loam, in which there is an admixture of broken soft brick and lime refuse—materials more suitable than crocks for this class of plants. The pots should be well drained, and, in order to secure thorough maturity, Crassulas are benefited by being exposed for a time after they have made their growth under glass. Water should be administered sparingly when they are in bloom, but when in active growth they require a liberal supply. A good companion plant to *C. lactea* is *C. quadrifida*, a pretty pink-flowered kind.—ARTHUR COOMBS, Witley Court Gardens.

Modern Competition.—Our very distant relatives, the apes, are beginning to find useful employment in rural economy. A correspondent of a Ceylon newspaper states that large apes are now regularly employed in the Straits settlements to gather Cocoanuts. These monkeys are imported from Acheen in batches, like coolies, and are marched round the plantations by their owners, who let them out on hire. A line is first attached to each of these peculiar labourers, and he is then sent up a tree, where he is said to select suitable fruit with great discrimination, and to twist the nut round and round until it falls to the ground. Each successive fall of a nut is hailed by the hairy operator above with a chuckle of satisfaction. We are afraid the human natives will like this competition as little as the American workmen liked the introduction of their Chinese brethren. As yet, we believe, they have not struck for higher wages

THE FLOWER GARDEN.

THE BEST VARIETIES OF BEDDING PLANTS.

THE names of a few of the best bedding plants may be of some service at this season, as it is now the time to make provision for future requirements in this respect. Geraniums still afford the principal supply of flowers for summer decoration in most gardens. Softer shades than that of scarlet have been much sought after lately, and raisers seem to have no difficulty in producing what is wanted. Various tints of salmon, rose, and pink are now in vogue. Mrs. T. F. Fenn, Mrs. Keller, Mrs. Rogers, Mrs. Musters, Mrs. Turner, Mrs. Holden, Mrs. Gibbons, Florence Durand, and Annie Orton, are at present considerably in advance of many others; whilst Mrs. William Paul, Rose Rendatler, and several more of the same kind have lost favour considerably, and Amaranth, I understand, will soon be in the same position, as I hear that something of a far superior description has been produced. Corsair is the best scarlet I have seen; the colour is extremely rich, and the trusses are produced in profusion, either in pots or planted out. Of the same colour Vesuvius, Glow, and Glorious are good; I could never detect the slightest difference in the three. Bayard, Warrior, Lady Constance Grosvenor, Cybister, Lucius, and the old Stella, are useful kinds, of a reddish-orange colour. Amy Hogg, Trentham Rose, Violet Hill, and Lord Derby, are above mediocrity. I never could observe anything very superior in Le Grand as a bedding kind; the trusses are certainly large, but there are few of them. I do not like double-flowering Geraniums for bedding; when planted out they run more to leaves than flower. Fine-foliaged Geraniums are very suitable for bedding, but when used for this purpose they should not be allowed to flower; the majority of them are not showy. Amongst the newer varieties of these I know none to surpass William Sandy, Abraham Bass, Lady Manvers, and Lucy Grieve; and Mrs. Pollock, Crystal Palace Gem, Castle Milk, Pearl, and Flower of Spring amongst the older kinds. For a creeper or climber Mangles' variegated and Duke of Edinburgh are always useful. I have not mentioned one in every hundred kinds of Geranium that exist, but those I have given are sufficient, both as regards flower and foliage, and belong to many sections of tricolors, bicolors, &c. Centaurea ragusina is too well and favourably known to be lost sight of as a bedding plant. Polemonium coeruleum variegatum is a handsome plant, with leaves like green and white Fern fronds. It is not used so much as it should be, for it is not necessary to keep it hot throughout the winter. Imperial Blue and Tom Thumb Ageratums are amongst the best, and Sedum spectabile should be in every garden, for it blooms late in autumn, when fresh flowers are scarce. It is quite hardy. Tropæolums in general are valuable subjects; T. Cooperi is by far the finest I have seen. From June until October, it is simply magnificent. Excessive heat or wet has not the slightest injurious effect upon it. It should be planted in masses, although it looks well when planted singly, and whether viewed closely or from a distance it is alike pleasing. T. Bothwelliana is a splendid wall variety. Iresine is a dark foliaged plant, well fitted for flower-garden decoration in some places. It does not do well in the majority of places in the north, and seldom grows after it has been planted outside. Dell's Crimson Beet is everywhere far superior to it. Verbena venosa is a grand plant, with a beautiful violet colour. For this shade it is the finest I know, and may be mixed with any other white flowering or foliage plant. Mangles' variegated Geranium is often associated with it, and looks well as a companion to it. Amongst other Verbenas, Violet King is better than Purple King; yet they are both good. Crimson King is also good. Lady Victoria Scott is a very handsome plant that blooms freely; so much so that in autumn it is often difficult to get cuttings from it. Snowflake and Mrs. Holford are both fine whites. There are a great many more kinds in these and other shades of colour, but, for flower gardens, the kinds I have named are, in my opinion, the most suitable. I do not think Verbenas are so much grown now as they were at one time; they should never be planted where rabbits can get at them, or they will constantly remain stunted. Mildew attacks them in a wet season, and heat injures them in a dry one. Although many substitutes have

been introduced for the Calceolaria, I have seen nothing to come up to this plant; yet, where they do well, I know no other bedding flower that possesses the same hue as that of the bronze kinds, such as Gen. Havelock or Ambassador. C. canariensis, Prince of Orange, aurea floribunda, and amplexicaulis are what I consider the best yellows. Where these have failed, I have seen the yellow-flowering Tagetes introduced in their stead; but, at its very best, it will not compare with the Calceolaria, which should be tried in every possible way before it is abandoned. Lobelia speciosa is a valuable plant when bred from a good strain, otherwise it is useless; Trentham Blue is nearly as good. For a neat front line, L. pumila grandiflora is excellent. The great point in using these plants raised from seed is to have them thoroughly true. Dactylis glomerata is pretty and useful; being nearly white, it looks well against such plants as Violet King Verbena. Festuca glauca is of the same order, but its colour, especially in a dry summer, is nearly blue; both are suitable for front rows, and neither should be allowed to flower or seed. The same remarks apply to Gnaphalium lanatum. East Lothian Stocks would, of themselves, give colour and interest to a flower garden. They are during summer and autumn what Hyacinths are in spring flower gardening; they flower early, and continue to bloom late; they look well either when the first flowers are opening amidst the leaves; or further on, when the flowers are so profuse as to hide the leaves. The true Tritoma Uvaria is a stately-blooming plant, which has a grand appearance placed here and there along a back line in a broad border, or massed together. Too much cannot be said in favour of Pansies and Violas for summer bedding. They lack height, and, therefore, cannot take the same positions as the Calceolaria; but, otherwise, the yellow-flowering sorts are excellent. Their colours are very numerous; Viola Dickson's Golden Gem is unsurpassed either by Violas or any other yellow flower. Blues and yellows are the most distinct colours, as Blue Bell, Blue King, Yellow Prince, Canary, and many others. Whites and purples are well forward. For carpet bedding, Alternantheras are the finest plants that can be used. A. amoena is the most beautiful in colour, being lively magenta; but it is more tender than the less highly-coloured A. amabilis, A. magnifica, and A. paronychioides. Where Oxalis corniculata rubra is used, it must be kept within bounds, or the whole place will soon be overrun with it. Pyrethrum Golden Feather is a common plant of great worth. The varieties of Echeverias are so numerous and interesting, that it is difficult to make a selection. E. metallica is much used as a tall kind, and E. glauca metallica, E. pumila, E. glauca, and, indeed, the whole are well worth a place. The same may be said of every kind of Saxifraga and Sempervivum. In planting these succulents, it is best to keep them as much together as possible. They do not mix well with the generality of flowering plants, unless where edgings of them are made. The whole grouped together are very pleasing to look at. The three varieties of Thymus—lanuginosus, citriodorus, and variegatus—are pretty sweet-scented plants for edgings. They stand out all winter, and may be used in the spring flower garden. Coprosma Baueriana variegata is another handsome plant; the leaves are conspicuous, green and white, with a dwarf and somewhat creeping habit. It is difficult to propagate. The best way to overcome this is to plunge the pot containing the old plant in a propagating bed, and layer the shoots which droop over. Bambusa Fortuni variegata might often be planted out with advantage in many places; small plants of it do well for edgings, and larger ones when planted singly. The foliage of the Sensation Chrysanthemum gives a yellowish-creamy shade in a back line when these colours are in request. Antennaria tomentosa is a little gem with silvery leaves. It is quite hardy, and has the peculiarity of looking well anywhere; it is very serviceable for edging, as it is of a creeping habit. Santolina incana is of nearly the same shade, and as pretty in summer. It grows from 4 to 6 inches in height, and is herbaceous. All the Mesembryanthemums are plants of great beauty and interest; M. cordifolium variegatum is, perhaps, best known and most used. Its foliage is very pretty, but not so curious in form or arrangement as that of many others of its kind. It is a pity that Coleus Verschaffeltii does not succeed everywhere; in summer, and after it has got sunburnt, it looks like rows of

exquisitely moulded rich metallic bronze. I have seen it do well in the sheltered nooks in the flower-garden at Archerfield and Beil, in East Lothian; but I never saw it flourish further north than at Mayfield in Stirlingshire, and in Scotland generally it cannot be put out with certainty. Such plants as Pentstemons, Heliotropes, Pinks, Carnations, Sweet Williams, Phloxes, and many other easily-grown sweet free-flowering plants, are not generally considered "bedding plants;" however, they always find a place in a spare border, and there their beauty is none the less appreciated. *Abutilon Thompsonii* is a showy-foliaged plant for bedding; the leaves are blotched all over with green and golden-yellow. Amongst subtropical plants, *Caladium esculentum* is a noble one, and *Ficus elastica* is invariably useful. Cannas are the best for the inexperienced to start with; they grow freely, and have a very tropical aspect; their foliage is of many different shades. *C. rubra perfecta*, *C. robusta*, *C. discolor floribunda*, and *C. nigricans* are amongst the best. *Yucca aloifolia variegata*, *Y. filamentosa variegata*, *Y. gloriosa*, *Seaforthia elegans*, *Solanum marginatum*, *Dracaena australis*, *D. Draco*, *D. angustifolia*, *Wigandia Wygerii*, *Chamærops Fortuni*, *C. excelsa*, *Latania borbonica*, *Arundo conspicua*, and numerous Aloes, Agaves, &c., are some of the principal plants for making a comparatively hardy and not easily damaged subtropical bed.

J. MUIR.

BLUMENBACHIA (CORONATA) CHUQUITENSIS.

(CAJOPHORA.)

THIS pretty species was introduced by Messrs. Veitch from Peru, through their late collector, Mr. Pearce. It is a dwarf shrubby half-hardy annual, forming handsome tufts about 1½ feet high and



Blumenbachia (Coronaria) Chuquitensis.

about 1 foot through. The flowers, which are borne in great profusion, are of a striking orange-red colour, coronal-shaped, and are about ¾ of an inch deep by 1½ inch in diameter. Its branches and leaves are clothed with hairs, which sting like those of a Nettle. The other species of *Blumenbachia* in cultivation are *B. insignis* and *B. multifida*. *B. insignis* has an angular-branched stem, clothed with hairs, some of which are simply glandular, and others of a stinging character, with opposite palmately-lobed or deeply-pinnatifid foliage, and flowers produced singly from the axils of the upper leaves, on long foot-stalks, which are at first erect, but ultimately drooping. The blossoms of this species are pure white, an inch across, with compressed keeled petals, furnished with a large serrated tooth on each side. *B. multifida* is a plant of much stronger growth, more hispid with stings, and with much larger five-parted leaves, longer two-bracted flower-stalks, and broader obtuse petals. Both species are natives of the southern parts of South America.

PROF. OWEN ON PERMANENCE OF VARIETIES.

It is but justice to the author of the "British Flower Garden," in relation to the "permanence of varieties" mooted in some of the late numbers of THE GARDEN, and to the share taken by insects in their production, in the plant kingdom, to recall attention to the following passage:—"Gladiolus Colvillii—A very splendid hybrid production, that was raised, in 1823, at the Nursery of Mr. Colvill, from seeds of *Gladiolus concolor* that had been fertilised by the pollen of *G. cardinalis*; all the plants that have yet bloomed have been exactly alike, not the slightest variation in them; which confirms our belief that the numbers of species of plants are daily increasing, in the same manner, by natural means, as we increase them by artificial ones; indeed, we cannot see how it can be otherwise, particularly in warm countries, where myriads of insects are continually flitting from flower to flower, and fertilising one species with the pollen of another. By this means of producing hybrid plants in our collections, the flowers may be much improved in beauty and variety, as it is only necessary to consider what two colours to be mixed would cause an intermediate one, surpassing either, with part or all of the spots and marks belonging to both; and plants raised from the seeds of the male plant, if fertilised with its own pollen, will all come as true as any species whatever; not, as has been advanced by some, return by degrees back to one or other of its parents: that is entire nonsense, as anyone who practises raising male plants must soon be convinced of." The results of such experiments, and the conclusions therefrom, are of a higher scientific character and import than the naming of new species from dried plants. In a national *Hortus vivus*, applied to its proper and peculiar aims, these assertions and convictions of Sweet, in 1826, might have been tested experimentally, in such variety and during such tract of time as would have precluded the necessity, more than thirty years after, of a confession of faith, in the "Botany of the Antarctic Voyage," as to the origin of species, based on similar experiments and results made and obtained, elsewhere than at Kew, in private gardens or establishments. I am induced to add this remark by seeing, in your last number, that the national *Hortus siccus*, founded by Sir Joseph Banks, and maintained at the public cost in its proper metropolitan locality, the British Museum, has been deprived of "the collection of dried plants from the banks of Lake Tanganyika, sent home by Lieut. Cameron, which are now in the hands of Dr. Hooker." The keeper of the national collection of dried plants, or botanical department of the British Museum, is relieved of his proper duty, for which he and his assistants receive their salaries from the nation; and the time spent on these dried plants at Kew is so much abstracted from experimental work on the living plants there, which was the prime intention of the wise administrator, Sir Joseph Banks, through whose suggestions and recommendations those botanical gardens were founded and developed by His Majesty King George III.

Sheen Lodge.

RICHARD OWEN.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Protecting Ornamental Beets.—These may be protected by laying a few branches over their tops in autumn, and covering them over with Fern or dry litter. When uncovered in spring, the young leaves will be found to be fresh and to possess the most exquisite colours. The litter should not be laid on them so thickly as to exclude air.—J. T.

The Prostrate Fuchsia (*F. procumbens*).—Dr. Masters showed, at a recent meeting of the scientific committee of the Royal Horticultural Society, on behalf of Kinghorn, a fruit of *Fuchsia procumbens*. The fruit is about half an inch long, obovoid, pink, and covered with a glaucous bloom. It is, therefore, an additional attraction to this interesting species, which is likely to prove a hardy one.

Saxifraga longifolia.—Mr. Muir a few weeks ago stated that he had long edgings of this beautiful plant in the kitchen garden. If it be the true "Queen of Saxifrages," it must indeed be rare and beautiful, but I suspect it is the commoner *S. cotyledon* or *pyramidalis*, which is very generally mis-named *longifolia*. The finest of the section, next to true *longifolia*, is probably the variety named in some botanical gardens *nepalensis*. The strap-shaped leaves are very fine and distinct; it is a free bloomer, and the inflorescence is very striking.—SALMONICEPS.

Origin of Fuchsia Riccartoni (see p. 150).—This originated at Riccarton, the seat of Sir Wm. Gibson Craig, Bart., near Edinburgh, and not at Port Famine, as Mr. Tillery supposes. It was raised from seed by the late Mr. John Young, then gardener at Riccarton, and afterwards for many years gardener at Archerfield. Miss Gibson Craig painted a beautiful flowering-branch of this Fuchsia and presented it to Mr. Young some time before he left Riccarton. I have frequently seen this painting when at Archerfield.—RICHARD NISBET, *Aswarby Park Gardens*.

Hardiness of Liliun giganteum.—Mr. Baxter, curator of the Oxford Botanic Gardens, mentioned to me the other day the case of a plant of this species which had stood in a pot in the open air during two winters without injury. It was then planted out, and the next season was found killed by frost. The ground is very wet at Oxford during winter. Many argue that if a plant will stand being frozen through, as it would be in a pot in the open air, it would be better in the open ground, where it would not be subjected to so low a temperature; but it is evident that the state of the drainage must be taken into account, for it is certain that many plants which are hardy in dry soils will not survive in those that are wet.—J. CROUCHER, *Hammersmith*.

THE INDOOR GARDEN.

DRACÆNAS.

THESE are very common inmates of plant-stoves and green-houses, some of the species requiring the former, others the latter kind of protection. They are all exceedingly attractive, some of them having most beautiful and conspicuous foliage, whilst their habit is such as to render them very useful for all kinds of decoration. They are easily grown, and difficult to kill, although to bring them down to a ragged unsightly condition (as is often seen in plants with their bottom leaves half decayed and the young ones blemished at the points), is a very simple matter. Small plants are generally the most needed and serviceable for room and vase embellishment; and, when used for this purpose, for which they are more and more in demand, they remain a long time in perfection. Larger plants are required frequently for staircase, balcony, and entrance-hall ornamentation. The drooping foliage of some, the upright leaves of others, and the tropical appearance of all, render them splendid objects when used in such places. Some of the most tender species are sometimes placed in the subtropical bed or garden during the summer. This treatment can only be given them in southern counties, and I have often felt sorry to see their dejected appearance in such situations; with the greenhouse kinds it is different. Dracænas should be very extensively cultivated on account of the extreme easiness with which they may be propagated; a single stem, 3 feet in height, will produce three dozen young plants. When any plant becomes uselessly tall or bare of foliage, it should be cut into pieces about an inch long. These may either be put into a bed of soil on a hotbed, or be placed thickly in pans filled with a mixture of peat and silver sand. After watering, the pans should be plunged in a bottom-heat of 85° or 90°; here they should not be allowed to suffer for want of water, although, while plunged, the quantity required is not great. The young plants sometimes come up irregularly, but none should be taken from the pan until they are all fit for removal. As soon as this is the case, the whole panful may be carefully turned out, and potted singly into 3-inch pots, without damaging the young roots. They should again be plunged in the same place, and kept there until they show signs of growing; after that they may be removed, and placed on a shelf or some other hard bottom in the plant stove or propagating pit, where growth should be encouraged until they are ready to shift into larger pots. Hitherto they will have been potted in the same material as that in which they were rooted, but, at this shift, peat, sand, loam, charcoal, and a little decayed Mushroom dung may be introduced with advantage. The mixture must not be too fine, but sufficiently so to admit of a certain amount of all the ingredients being put into a 5-inch pot. This size will grow well-furnished plants until they are 18 inches or 2 feet high; when, if they are wanted of larger dimensions, they must be shifted on—the same mixture being used as that just referred to. After being shifted from the small pots, they generally do not require more root room for one season than is afforded them in the 5-inch pot; so that the following spring is a suitable time for potting on large plants. I have seen some very fine plants grown in 5-inch pots, which is the most convenient size for decorative work. Another means of propagating is found in the root. Large plants form a number of thick leading roots at the base of the stem; at the end of each of these there is an eye. If an old stem be cut up, these eyes should be cut off, and put in together with the other eyes. In shifting well-grown plants into larger pots, these eyes may be taken off during the operation without injuring, or checking the progress of, the plant. In this way, a fresh stock may be raised without even cutting down a large plant; and when only a few are required, I prefer these root growths to any other. Sometimes the tops are put in as cuttings, but I never found these make such good or handsome plants as those from eyes. When propagated, and in growing order, their daily requirements are few. A slight shading is necessary at all times during strong sunshine. They are particularly sensitive to dryness at the root, which often entails the loss of the lower leaves; and the points of the tender young foliage are sometimes allowed to wither through the same cause.

At the Clifton Hall Gardens, Mr. Anderson grows a good many Dracænas in pans about 10 inches in diameter, and 2 inches deep. The young plant is placed in this when quite small, so that the root is easily covered with soil. When this is done, some of the finest kinds of the Selaginellas, and the pretty creeping *Panicum variegatum* are planted on the surface of the pans, a method which produces a remarkably pleasing effect, as the creepers form a cushion of green and white underneath the drooping high-coloured leaves of the Dracæna. The following I consider are among the best to grow either singly or collectively:

D. ferrea versicolor (terminalis).—This is one of the oldest, best known, and most beautiful. It was introduced into this country, from the East Indies, in 1820. The leaves grow from 1 to 2 feet in length, and 4 and 5 inches in width; they are of a dark green colour, richly and profusely shaded with brilliant scarlet; the young leaves, and the entire upper part of the plant are sometimes wholly scarlet. It succeeds best in an exotic stove.

D. Macleayi.—One of the best of the dark-leaved kinds; it does not grow rapidly, but is very robust. The leaves are generally from 18 to 24 inches long, and are of a very deep brown hue, with a metallic polish. It contrasts strikingly with the former in colour, but is of the same graceful habit.

D. Chelsoni.—This makes a fine plant. The leaves are very large; the ground colour is a bronze-green edged with crimson.

D. Cooperi.—This somewhat resembles the first described, but is, if possible, more beautiful in colour and more graceful in habit. It is moderately hardy, and does fairly in the greenhouse during the summer months.

D. Guilfoylei.—A magnificent species, with long narrow leaves beautifully variegated and striped with bright rosy-pink, white, green, and red; the leaf-stalk is also variegated. Being a native of the South Sea Islands, it is somewhat tender, but, like the rest, easily grown.

D. gracilis.—This is an elegant little plant; the leaves are only about 1 inch in breadth, 12 inches in length, and incline nearer to the horizontal line than those of other kinds. The main colour is bright green, margined with purple.

D. Dennisoni.—Another elegant species, of the deep bronze type; leaves, from 12 to 15 inches long; habit, compact; other characters good.

D. regina.—This is different from any of the preceding, and a fine variety; leaves, erect, centre green, edged with creamy white; sometimes the upper half is quite white, which gives a speckled appearance to any collection with which these plants may be intermixed.

D. umbraculifera.—This is quite different from any of the above; it grows several feet high; the leaves are generally about 3 feet long and 1 inch broad, and of a rich glossy green colour; at the top they stand straight out, but the older ones at the bottom droop. The plant, when large, forms a conspicuous object anywhere; it grows rapidly.

D. magnifica.—Leaves, about 8 inches in width, and as much again in length. When young the leaves are pink in colour; when old they are of a purple-bronze shade.

D. Draco, D. australis, and D. atro-sanguinea, are nearly hardy, and useful for conservatory decoration. I may further state that greenfly is sometimes troublesome on the young leaves; fumigation is the remedy for this, and a sponging now and then keeps the foliage clear of dust and insects.

J. MUIR.

THE BEST FRANCISCEAS.

Franciscea confertiflora.—This is one of the most useful of all stove plants. A warm greenhouse or intermediate-house will suit it, but the temperature must not be allowed to fall below 45° Fahr., or injurious effects will follow. It is useful as a decorative plant, and for exhibition it ranks as one of the best, its habit being good and its colour of the dark purple which is so much needed among plants in bloom or in the exhibition tents. When bloomed under proper treatment the flowers are very dark, but, if opened in heat, they become much lighter in colour. The greenhouse is the place in which to bloom them, and, with plenty of light and air, colour and substance will be obtained, and the plant rendered more

robust and better capable of bearing removal to exhibitions. If the plant be well tied and treated as recommended, it may be used more than once or twice. After its return from any exhibition, examine the plant carefully, and pick out the stale blooms, placing the plant in the house again; in five or six days it will be ready for use again with a crop of bloom as good as before. After the blooming season is over, and if the plant be small, and you are desirous of increasing its size, encourage its growth, stopping any shoots that may be too vigorous, in order to throw more strength into the smaller and weaker growths, and, towards the fall of the year, when the plant has done its work, it will begin to set its bloom for the following season.

Franciscea Lindeni.—This variety has only recently been introduced, and is therefore comparatively unknown. It is my belief, however, that when more widely grown it will be appreciated on account of its being easy to manage. Its character is very different from that of *confertiflora*, which sets its bloom in the autumn, whilst *Lindeni* produces its bloom on the growth it makes in spring. After it has finished blooming, it can be treated as *confertiflora*, if an increase in size is found desirable. When tied and put into shape, take off all the points, or rather stop them, and then you will have several breaks instead of one when the plant is started for blooming. It will stand in a warm greenhouse throughout the winter, till six or seven weeks before it is wanted; place it in the intermediate-house till the flowers are nearly opened, and then harden off in the greenhouse; it will thus obtain colour, and be fitted for exhibition.

Franciscea calycina is distinct as regards habit. The flowers are large, and, though useful for home decoration, it is not so well suited for exhibition purposes, as the flowers bruise easily in carriage; anyone growing *Francisceas* for exhibition alone may, therefore, dispense with this variety, although it is well worth growing for other purposes.

Franciscea eximea.—This is one of the hardiest of all the *Francisceas*. It will stand through the winter in a cold greenhouse, where it will retain its leaves till spring, and before blooming it will be clothed with new foliage, so that the treatment for *Lindeni* will suit *eximea*, which, like the former, flowers on the young wood it makes in the spring. There are other kinds, but those mentioned are the most valuable; and, well grown and bloomed, will well repay anyone for their trouble. I have found them thrive best when potted in equal parts of good loam, peat, and sand, with the assistance, in the growing season, of clear liquid manure, or one or two dressings of Standen's manure. When the plants get established, and of a reasonable size, they will go on for years without shifting, but their wants—of which the grower will be the best judge, from having them always under his care—must be attended to.

J. W.

Hardy Plants under Glass.—I have read with interest the letter of "D." in your columns (see p. 115). I am in the habit of doing much as he does. One tires of *Cinerarias* and *Primulas* in a greenhouse, and I do not find it so easy at all times to have variety there; but hardy plants, which have been taken from the open ground, are a great help, and in many cases they can be put in the border again without receiving any injury. Another advantage of this method is, that by subjecting specimens of the same sort of

plant to different influences you very greatly prolong its blooming time. Thus I have now *Anemone apennina*, *Dielytra spectabilis*, &c., in full flower in a cool greenhouse, and when they go off there, others of the same kind will be fast coming on in the garden. I think, however, that "D." might add to his list several very desirable plants, such as *Dielytra spectabilis* beyond all others; two or three sorts of *Spiræa*, *Trillium grandiflorum*, *Schisostylis coccinea*, *Stokesia Cyanea*, &c. I wish that I knew the names of some more good things for this purpose, for I find that while some respond to it easily others resent the treatment altogether.—H. EWBANK, *St. John's, Ryde*.

COCHLIOSTEMA ODORATISSIMA.

THIS plant was introduced into Europe a long time ago, but it is not with certainty known whence it came or who first discovered it. Everything, however, points to the fact that, like its beautiful congener *Cochliostema Jacobiana*, it comes from tropical America, most likely from Brazil. It was originally cultivated under the name of *Tradescantia odoratissima*, but was re-named by M. Charles Lemaire, under the impression that it had nothing whatever in common with the genus *Tradescantia*. It is an herbaceous plant, the leaves of which are long and graceful, pale on the upper surface, with undulated edges ornamented with red. The flower is composed of



Cochliostema odoratissima.

three canicular sepals of a yellowish-green at the base, becoming reddish towards the extremities, and three large oval obtuse petals, edged with blue, with a larger white blotch at the base. The most interesting part of the flower from a physiological point of view is the stamen, which is composed of a short filament dilated so as to form a conical pouch, woolly at the base, acuminate at the upper extremity, and enclosing two organs which somewhat resemble the screw of a wine-press, and taper off at the two extremities. The *Cochliostema odoratissima* (says the "Revue Horticole") enjoys a damp warm border, an open and turfy rather than a sandy soil, with which may be mixed a little *Sphagnum*, the whole being well drained. Frequent sprinklings and waterings are necessary during its

growth, which must be withheld during its season of rest. It is propagated by means of offsets.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Fuchsia Rose of Castile.—This fine variety makes a most showy pillar and rafter plant in a greenhouse or cold conservatory. I have it here trained to an ornamental wire trellis of pillar, and it has now got to the height of 12 feet. Being spurred in at pruning time, it is one sheet of bloom from bottom to top all through the summer and autumn months.—W. TILLEY, *Welbeck*.

Continuous-blooming Indoor Roses (see p. 168).—No Rose will bloom always; but some will bloom longer and oftener than others, as, for instance, kinds belonging to the Tea and Noisette sections. I should recommend your correspondent to get *Gloire de Dijon*, *Madame Falcot*, *Madame Maurin*, and *Vicomtesse de Cazes*. For a Hybrid Perpetual, none beats *Jules Margottin*.—N. H. P.

Chrysanthemums to Bloom in Large Quantities.—I want a large quantity of cut blooms of this favourite autumnal flower, and I am thinking of planting out an abundance of cuttings of it in the reserve garden, and taking the plants up in the autumn and putting them pretty thickly on the floor of the conservatory, merely filling in amongst the roots with soil and then watering. Will anyone say whether or not I may trust to this plan for yielding me what I require?—N. H. P.

Virgin Cork for Covering Garden Tubs.—Round or square tubs for garden purposes, especially when used in houses, are not satisfactory; on the contrary, they often look unsightly in themselves and spoil the effect of the plants. At the Alexandra Palace, Mr. McKenzie has got rid of this objectionable feature by covering them with virgin Cork, and the effect is extremely pleasing. Round the rims and bottoms of the tubs are single bands of cable rope, which impart to them a finished appearance. Small tubs and baskets may be made entirely of Cork, but for large plants it is not strong enough.—J. CROUCHER.

GARDENING FOR THE WEEK.

Flower Garden and Pleasure Grounds.

CONTINUE to increase the stock of various kinds of bedding plants in such quantities as may be required. Beds formed on Grass or gravel are not unfrequently margined by an edging, which may consist of sundry materials; but such as are formed of glass are better than any live edgings for flower beds, as they tend to preserve their form, and may generally be allowed to remain undisturbed for several years. In all cases, however, wherein tiles are not used, the turf round the beds should be carefully cut into proper shape by means of a sharp knife or edging iron. But, as flower beds generally form a geometric group of more or less intricacy, each bed forming a component and necessary part of the whole, it is expedient, in performing this operation, to ascertain the exact centres from which the various curves forming the beds are described, otherwise the beds will soon deviate very considerably from their original shape should the operation of edging them be repeatedly performed by the aid of the eye only. The rough sketch of the garden, however, which I have often recommended to be used as a memorandum for the names and quantities of plants required for the beds, if correctly drawn, could also be made to materially assist in this matter, by having the various centres distinctly marked upon it. In planting, care must be taken to avoid a too free use of the primary colours, such as those produced by the scarlet *Pelargonium*, the yellow *Calceolaria*, &c.; and in nearly all flower gardens a judicious use may with advantage be made of succulents, and other ornamental-foliaged plants of various kinds. Many succulents which are found to be so useful for this purpose are quite hardy, such as the *Sempervivum californicum*, *Sedums* of various sorts, &c.; while the *Echeveria secunda glauca*, on account of its soft neutral-tinted foliage and compact habit of growth as a marginal plant, requires only the protection of a frame or cold pit, and should be kept very dry during the winter months. Small plants of this *Echeveria* should now be encouraged to grow; while larger plants of it should be kept as cool and quiet as possible, in order to have them all, as nearly as possible, of a uniform size when the planting-out season has arrived. Sub-tropical plants of various kinds, intended to be increased by means of division and cuttings, should now be placed in strong heat, in order that their propagation may be proceeded with as rapidly as possible, so as to have them sufficiently strong when turned out to produce an immediate effect early in June, which is as early as this can be done with safety. If it be desired to raise a stock of the various kinds of *Cannas* and similar plants from seeds, the latter ought to be sown immediately if the plants are expected to be effective during the first season. Young plants of the *Musa Ensete* will probably form very effective objects in the sub-tropical garden, but its seeds should be sown at once in order to get the plants of sufficient size to turn out. The middle or the end of March, however, will be sufficiently early to sow seeds of many of the quick and strong-growing annual plants which are so effective in this style of planting, such as the various *Castor Oil* plants, *Maize*, and its variegated or striped variety, *Beet*, *Solanums*, *Amarantuses*, &c. The various varieties of *Gladioli* for early flowering should be planted now in soil which has been liberally dressed with well-rotted hotbed or cow manure, and which has been deeply dug or trenched. They may be planted in beds, with the bulbs placed at a distance of 10 or 12 inches from each other, and planted about 3 inches deep; or they may be planted in clumps, consisting each of a few bulbs, on the Rose border, between standard or other Roses, or with very good effect in front of *Rhododendrons*—the soil prepared for American plants being generally found to suit *Gladioli* well. The following beautiful and interesting plants are also found to succeed admirably when planted in a similar situation, all of which should be planted about the present time, viz.: *Ixias*, *Sparaxis*, *Tritonias*, *Watsonias*, *Nerines*, *Zephyranthes*, &c., the bulbs of which may all be planted about the same depth, as has been recommended in the case of the *Gladiolus*. The stakes and ties of standards and other plants requiring support should be examined, and replaced where necessary. The margins of shrubbery borders will now be gay with the *Snowdrop*, *Crocuses*, *Primroses*, *Violets*, &c. Much of the charming effect, however, which these welcome harbingers of early spring produce will be lost if neatness and good order do not characterise all their surroundings.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Roses.

Rose Forcing and Roses for Forcing Through the Winter Months.—This winter has been a severe one for Rose forcing, for we have had more rain and less sunshine than usual. A few remarks, therefore, upon the varieties that have succeeded best may be of advantage to those who desire to go thoroughly into Rose forcing. I have found it to my advantage to have a small house set

apart expressly for forcing Roses, and have thus succeeded for two seasons in cutting Roses all the year round, having obtained all the best varieties of pot Roses and nearly all the Tea varieties that are useful for pot culture. The first matter that, in order to ensure success, must be thoroughly attended to is freedom from greenfly, mildew, or caterpillar, and the glass should be kept clean during the winter months, so as to make the house as light as possible. These pests are easily overcome by remedies given in former numbers of THE GARDEN. November and the early part of December, in my experience of Rose forcing or growing, is the worst time for producing flowers, but by carefully housing the late summer-pruned plants there are many varieties that will be found to have enough buds to keep up a succession of flowers till the early forced varieties begin to come into flower about the end of December. This cannot be done with a few plants, but it necessitates the possession of a good stock of pot Roses. In December, for Christmas:—*Maréchal Niel*, *Lamarque*, *Goubault*, *Isabella Sprunt*, *Gloire de Dijon*, *Sofrano*. The flowers of these were all excellent for the time of year, with *Duke of Edinburgh* and a few other hybrid-perpetual flowers, but they drop as soon as cut, although for one evening they last well. In January for New Year's Day and through the month *Maréchal Niel*, *Isabella Sprunt*, *Goubault*, *Gloire de Dijon*, *Sofrano*, *Madame Falcot*, *President*, *alba rosea*, *Belle Lyonnaise*, *Devoniensis*, *Lamarque*, *H. P. Centifolia rosea*, *Beauty of Waltham*, *Duke of Edinburgh*, *Charles Lefèvre*. The above have answered the best; they have flowered as well as could be expected and have fine blooms. For February the foregoing kinds must be added to *Souvenir d'un Ami*, *General Jacqueminot*, *Victor Verdier*, *Boule de Neige*, *Elie Morel*, *Dupuy Jamain*, *Exposition de Brie*, *Madame Julie Doran*, *Princess Louise*, *La France*, *Comte de Nanteuil*, and *Catherine Mermet*. These varieties I have found to force well, and I must state that *Maréchal Niel* is without exception the easiest Rose to force, and the freest flowerer through the winter. No forcing house ought to be without one of these plants. The flower of *Maréchal Niel* and *Devoniensis* stand best after being cut. *Goubault*, *Isabella Sprunt*, *Madame Falcot*, *Sofrano*, and *General Jacqueminot*, should always be cut in the bud, for, if allowed to expand, the flowers are useless for packing, and very soon drop. *Alba rosea*, *Lamarque*, *Duke of Edinburgh*, *La France*, *Charles Lefèvre*, and *Boule de Neige* are excellent varieties, both in bud and open, and are about the best and foremost flowering varieties for forcing; as perpetual flowerers *Maréchal Niel* and *Goubault* bloom all the year round. Most of the other fine flowered varieties will now be coming into bloom. I have only enumerated those I have found do well for very early work.—H. G.

Floral Table Ornaments.

Ornamental stands for growing flowers and plants can be easily constructed in the following manner. Take an ordinary 10 or 12-inch seed pan, and have it painted green outside; cover the bottom of the pan with broken crocks, and fill it in with soil to half its depth, as though about to sow seed. Then fit it up with whatever plants and flowers may be desired; *Adiantum cuneatum*, or any other light-growing Fern in the centre, with a wreath formed round it of *Snowdrops*, has a very pleasing effect; or, for this outside ring, dwarf, white, and scarlet Tulips are also well adapted. Those who may not care for a Fern in the centre, can substitute a group of three Hyacinths, or a clump of Lily of the Valley; either white Hyacinths, or the latter with bright blue dwarf *Scillas* round the outer margin, look well. The fitting up of these little stands is, however, quite a matter of taste, as, what might please some, others would not care for. However, presuming one to have had the flowers placed in their proper position, they should be packed in with fresh wood Moss, to keep them steady and also to cover the soil, which, if left exposed, looks unsightly. Fresh-looking Moss should be chosen, and the effect of the flowers growing up, as it were, through it, is very pleasing. If the appearance of the outside of the pan be objected to, it can be hidden with an expanding cover similar to those employed for concealing pots; if this cover be of gilt rustic work, the dark green back ground throws it up well. These little pans can also be purchased, made of rustic terra cotta (like those covered with a bell glass, which form Fern cases), or of virgin cork. The two last are most expensive, and do not look as well as the ordinary pan, if the latter be covered with a case such as I have described. These little stands look well in the drawing-room, and form tasteful ornaments for the centre of a small dinner table for every day use. If they are used for the latter purpose, *Scillas* should be avoided, as they lose their pretty bright blue shade when subjected to artificial light. They are, however, well suited for the breakfast table.—A. HASSARD, *Upper Norwood*.

Indoor Fruit Department.

Vines.—When all the soil intended for making Vine borders is chopped up, one barrow load of lime rubbish, and the same quantity of roughly ground bones, should be added to every ten barrow loads

of it, and the whole should be turned over two or three times until all the materials are well mixed together. Charcoal may be used instead of the lime rubbish, where the latter cannot be conveniently obtained. They both serve the same end, viz., keeping the soil open; and where it is naturally of a very open character, they may be dispensed with altogether. The bones should not be overlooked. I dislike horse droppings in Vine borders, as they have a tendency to produce fungi, and other kinds of soft manure are not lasting. Vines to which such manures are given often do remarkably well for a year or two, and then suddenly begin to go back. Young Vines planted last season, and which have been started this year with the intention of getting them in early, should now be pushing vigorously, and require, at first some care in training. When they are planted $2\frac{1}{2}$ feet apart, only one rod should be taken from each root. If a foot or two wider than this, two may be taken. All the shoots should be rubbed off, except the two from which the canes to be retained are to spring. These should be trained at equal distances one from the other, and should be brought away from the bottom in the form of the letter V. All tendrils and lateral growths should be kept within bounds, in order that the leader may make as fine a shoot as possible, as the lower part of it will have to bear a crop next year.

Pines.—Select the first mild day for re-potting and overhauling the stock of these. Soil and pots should be in readiness before disturbing a single plant, in order that no check may be given through exposure. Large fresh well-rooted suckers may be shifted into their fruiting pots at once, while small plants, indifferently rooted, should be re-potted into small pots and grown on for six weeks or two months before being placed in large pots. Smooth-leaved Cayennes, Charlotte Rothschilds, Providences, and other strong-growing varieties, should be placed in fruiting pots 12 inches in diameter across the mouth, but pots 2 inches less will be large enough for Queens. When potted, they should be well and firmly plunged in the beds in which they are intended to be grown throughout the summer. Previous to plunging them, the old fermenting material should be mixed with a liberal addition of new tan, and the glass and wood-work should be well scrubbed with a brush and soft-soap and water. Two feet apart in the row will be room enough for Queens, and 6 inches more for the others. In plunging, the pots should be placed level, in order that they may hold water. When all are plunged, a string supported by stakes should be put along the edge of the bed next the pathway to prevent the leaves from coming in contact with passers by. If the plants are tied up, when untied, every leaf should occupy its former position; 80° will be sufficient bottom-heat with which to start, and it should not be allowed to rise above 5° more. Re-plunge those unfit for fruiting in the bed from which they were taken.—J. MUIR.

Hardy Fruit.

The cold we are now experiencing has given a salutary check to the swelling of all kinds of fruit buds; no time, however, should be lost in preparing protection for wall and other fruit trees. If expensive coverings of glass, canvas, or netting are not to be had, one or other of the methods of protection recommended in a former Calendar should be adopted, and labour or trouble must not be taken into consideration if a crop of fruit can be saved by these means. On bright sunny days the coverings should remain down, in order that the opening of the blossom may be retarded as long as possible, for, as the season advances, there will be a greater likelihood of favourable weather at the "setting" period, which is always the most critical. Presuming that planting has been completed, each tree requiring it should be staked and tied; tar-twine is the best for this purpose, and a bunch of hay, straw, or moss should be placed between the stake and the tree to prevent injury, and, if it has not previously been done, spread over the roots a thick layer of decayed leaves or litter, as drying winds may soon be expected, and mulchings of this kind neutralise their effects. Stake and tie into form espaliers and pyramids, and see that all are correctly labelled. If American blight or scale be troublesome, paint over the trees with a strong solution of soft soap, sulphur, soot, and lime. As a rule, this should be done before the buds have begun to swell; but it may yet be done with safety. Cuttings of Gooseberries and Currants may now be put in. Select the straightest cuttings, and let them be at least 12 inches long, and plant in lines 18 inches asunder, and 3 or 4 inches apart in the lines. So soon as started, pick out all the eyes or buds, except a couple at the top, which will give clean stems to the future trees. The grafting season is now fast approaching, and all scions for the purpose should be prepared and heeled in, for it is necessary to successful grafting that the scion should be later than the stock, and this can only be managed by securing the grafts before the sap begins to rise. There being now so many good varieties of all kinds of fruit, doubtful or second-rate kinds should not be tolerated, but the trees headed down and grafted. Clay for grafting should be got ready by

tempering it well, and by working in with it a portion of horse-droppings to ensure adhesiveness.—W. WILDSMITH, *Heckfield*.

Kitchen Garden.

A heavy fall of snow, accompanied by rather severe frost, has for the present suspended operations out-of-doors, so far, at least, as regards planting or sowing; but advantage might be taken of such weather to prepare materials for making up or renewing hotbeds, making reed or straw mats or screens, which are so neat and economical for protecting early crops in cold weather, or for laying over seed beds in early spring instead of using loose straw, which, in a private garden, looks untidy. Such screens are also equally useful later on in the season for keeping the earth cool, and encouraging the rapid germination of successional crops of Radishes, &c., in the hot weather. When the weather breaks and the land becomes dry enough for resuming operations, the sooner the spring-sown crop of Onions is got in the better, and especially is this necessary in the case of light soils, or where the crops suffer from drought in dry seasons, so as to get the young plants well advanced in growth early in the season. To obtain fine bulbs a long growing period is essential, and to obtain this object an early start is advisable. Screens should be more used in this way than they are, as, unfortunately, few gardens are so well provided with water as they ought to be, or, with what is equally necessary, proper machinery for its economical distribution. In dealing, however, with heavy retentive land, we must wait till the surface is dry. Assuming that the quarter intended for the main crop of Onions was well manured and worked up deeply during the autumn or early in winter, just previous to preparing it for sowing wheel on to it sufficient thoroughly-decayed manure, to which, if it can be had, charcoal dust, burnt earth, charred refuse, or any similar material may be added, so as to form a surface dressing about an inch or so in depth, rake it well about, so as to partially mix it with the surface soil, raking all smoothly at the finish, and removing all rough pieces and stones. I sow in drills from 9 inches to 1 foot apart, because of the facilities such a plan gives for hoeing and cleaning; otherwise equally good Onions may be had by sowing broadcast on 4-foot beds, if thinned early. In any case the ground should be made firm either by means of treading or rolling, and do not bury the seeds too deeply. The Brown Globe is one of the best Onions for keeping purposes, and the White Spanish or Nuneham Park for general early use. I have already said that, as far as possible, all things should be sown in drills, and we have here a very simple form of drill that any carpenter can make for a very small sum. The head and handle are formed like those of a common wooden hay rake, only much stronger and heavier; the head is made of Oak, 2 feet 4 inches long, $2\frac{1}{2}$ inches deep, and 2 inches wide, in which are inserted three triangular drills or teeth about 1 foot apart; the teeth are 3 inches wide and about the same in depth, and, of course, taper off to a point. In drilling a piece of ground, all that is required is to set the line properly in the first instance, and in drawing the implement across the quarter the first time, the end will run parallel with the line and close to it; afterwards one tooth will run along the last drill made, and in that way all will be kept straight and true. Laxton's Supreme, Hundred-fold, or any of the improved forms of Champion of England Peas, may be sown now, as may also William the First or any other esteemed dwarf early kind. It often happens that Peas sown in March will come in within five or six days of those sown in January, but in most places those few days gained are appreciated. In heavy soils where Parsley is a long time in vegetating sow some now in light soil in boxes, and transplant in April. I always transplant a part of my crop, and the transplanted is invariably the most curled, and best for garnishing. Make a small sowing of the scarlet Intermediate Carrot to come in after the Early Horn; but the main sowing of Carrots should in most places be delayed till the first week in April. Divide and transplant Chives about 9 inches apart. They are used in some places for flavouring Salads, &c. Sow strap-leaved Turnips on an east border where the soil is rich, and where the surface has been heavily dressed with charred material from the rubbish heap, a fertiliser which will ensure that free and rapid growth which is essential to mild flavour. The crop would be forwarded if a foot or so of hot manure could be had, so as to give a slight bottom-heat; but, as the season is now rapidly advancing, this is not absolutely necessary. Sow Chervil on a south border to come on early. Basil and Marjoram sown in heat should be pricked off when large enough, and pushed forward under glass for early use.—E. HOBDAV, *Ramsey Abbey*.

Deep-digging Light Land.—I am not overdone with labour power, and to get my land deeply dug without the extra labour and time of double digging, I get my men to dig with drainers' tools. These tools have blades 18 to 20 inches long, are spoon-shaped, and taper to the end, so that they leave the bottom ground as open as a 3 or 4-tined fork would do. The effect on the crops is remarkable.—N. H. P.

FORMING LAKES AND PONDS.

WATER seeks its bed in the lowest ground, which should always be made choice of for the formation of a lake; but, when the lowest ground cannot be made available, so as to bring the water into view from the house or the pleasure ground, and a higher level must unavoidably be taken, the view beyond must be stopped by planting. The designer, therefore, after he has fixed the sites, and taken such levels as may be considered most suitable for the purpose, will at once see the necessity of judicious planting about the lower end of the lake, so as to fill up, and shut out, as much as possible, the appearance of the valley below, especially in the vicinity of the lake. In most cases this will give the appearance, in a great degree, of water resting on a natural flat. In lining out lakes of large size, bold prominences and deep bays must be produced rather than tame, zigzag, or small indentations. In well-kept grounds, lakes or ponds must be characterised by the same bold curves; but the margins should be kept neat, with smooth Grass to the water's edge, rather than consist of deep, earthy, and broken banks. Yet gentle and grassy swells, rising immediately from the water, are important acquisitions; and some portions of the margins may be fringed with interesting and suitable plants. Islands are indispensable in lakes of considerable dimensions; they not only add greatly to the variety and interest of such pieces of water, but are of importance in assisting to conceal their real extent. The greatest depth of water in a lake should never, if possible, exceed 5 feet, in order to render it safe from accident during sailing excursions and winter amusements on the ice. This depth is, moreover, quite sufficient for fish, proper provision being made for their retreat, in severe weather, about the islands and in the deepest parts of the water. These retreats may be composed of roots of trees, or stones, reared together; or stones, sunk at intervals, with a slate across them. The water should also be clear, and not stagnant, and kept free from rubbish. Having decided upon the site, we must next determine the levels. If the fall of the ground is considerable, it will generally be better to lower the highest side rather than raise the head or dam too much. We would rather lose sight of a portion of the water nearest the point of view by the rising ground, than have a prodigious embankment; this would, in almost every case, not only be found to work better but please the eye more, especially with a judicious sloping of the higher ground, and with proper breaks in planting. The levels having been taken, a better notion of the form of the water will be ascertained. But in staking out in undulating ground, advantage must be taken of the lowest parts of the ground to give breadth or expanse to the water, and variety of form in its outline. Otherwise, cutting down the rising knolls would not only cause additional expense, but greatly lessen the variety of surface, which we ought ever to study to preserve. Where a bridge is to be introduced, two of these prominences should be brought near enough together to afford a natural site for that purpose; where it is not required for convenience sake, but only for effect, one end of it may rest on an island, in which case the latter must be sufficiently large to make a bridge seem useful for landing upon it. In shaping the embankment or head, much will depend upon its depth and extent. If the valley, where the head is formed, is narrow, its construction will not be difficult; but should it be wide, great caution will be required, not only for security against the pressure of water, but that its outline may be as natural as circumstances will allow. This will generally be best managed, and the pressure of water borne, by forming a large and bold promontory to shoot out a considerable extent into the lake, of sufficient surface to allow of an outlet for the water, and room for planting on each side of it, without interfering with the puddle. This will be most properly effected by raising the ground a little above the general level (with the exception of the margin close to the water), and so providing depth of soil for the roots to work in. Further, in forming the embankment, or head of a pond or lake, it should slope considerably under the water. This gives strength to the dam, inasmuch as the water bears upon the slope, and is not so liable to burst the bank as if the latter were more perpendicular. An equal, or rather greater, slope will be required on the contrary side of the bank; and it is indispensable that a

firm wall should be built where the water passes over, to prevent its being washed down. But if an interesting fall is to be formed (which certainly ought to be if water is plentiful, and if a walk can with propriety pass near it), it should be built in a natural firm form, with rugged massive stones.

Islands.

One island near the head will generally be necessary; and if sufficiently large and well managed, will be better than more. This should be placed 10 or 20 yards from the outlet, and perhaps should be the widest across the pond parallel with the dam, letting the side next the outlet of the water form a broken or irregular concave, in order to harmonise with the convex or promontory stretching into the water. Then, a little above the island, the margin or outline of both sides of the pond should be made to project into the water, so that, conjointly with the island, the eye may be prevented from discerning the end or outlet of water, thereby deceiving the mind as to its extent. But, in order to effect this properly, bushes and trees must be planted on the island and on the sides of the lake. In lakes of considerable extent groups of islands would be effective, and ought to be introduced, in preference to their being scattered singly all over the water. They must, further, be placed not as if by design, but rather to appear in connection with some of the smaller or moderate-sized promontories, and as if the water, from time to time, had severed them from the adjoining projection of the shore. Whatever may be the number of islands forming a group, care should be taken to have the largest of them about the centre. For instance; on all the sides but that next the shore, the smaller islands will appear most in character outermost, and the distance from one another must vary considerably. These islands may be from 5 to 30 yards or more from the side of the water, according to its extent; but must be sufficiently far from the middle not to appear central. In a lake of 50 or 100 acres several groups, composed of three, four, or five, of different shapes, may be formed; and one or two of these may be of considerable extent—say, from a quarter of an acre to one or two acres. Although formality should be avoided in placing islands, yet the appearance on both sides the lake should, in some measure, be equalised, leaving the widest portion of water about the middle, but still naturally broken or varied with the islands. Were there a large island and numerous small ones on one side of the lake only, from some points of view the water would appear out of balance, leaving the eye dissatisfied. This effect must be guarded against. The prevention of danger must be observed in the formation of water. Such danger too frequently arises from the usual way of forming ponds or lakes, and the means by which it should be averted are these:—First, it is quite unnecessary to have deep water close to the margin; as there is the same breadth or extent of water, and certainly an equally good effect is produced when the water is shallow as when it is of considerable depth. It is, therefore, of the first importance that a shelf or platform, 4 or 5 feet broad, should be formed all round the margin of the lake, admitting only of water resting upon it to the depth of from 6 to 9 inches, so that should even an infant fall in its life would scarcely be in danger. This platform may fall from the margin towards the water to the extent of 4 or 5 feet, at the rate of about an inch in the foot; the slope from that point must be much more rapid until it ends in the deepest part. If white pebbles, or pebbles of any kind, or even small stones mixed with sand, could be spread all over the shelf, it would add much to the clearness of the water and the general beauty of its edge. All the margin in natural and varied surface should not appear smooth and even, but Nature should be studiously imitated; and this will be greatly promoted by allowing at intervals steep or deep earthy margins to appear, and large stones, and roots or stumps of trees, to present themselves in masses and groups. Of course the margins in polished or kept grounds must assume a varied appearance, without being rugged. In all ponds or lakes it is necessary to use puddle of clay in places where embankments are made to dam the water, in order to prevent leakage. In such parts the puddle-dykes should be made in the ledge or shelf above-named, where, I think, it would be the least liable to be injured by the roots of trees and bushes. The bottom

ORNAMENTAL WATER



of the lake, also, when the materials are not naturally retentive, will require puddling, especially about and under the dam, or other raised parts.

Lake Vegetation.

Trees and bushes are indispensable embellishments to water. They are important for concealing its real extent, besides producing light and shade. In planting near water we must not interrupt the best and most lengthened view of it, as seen from the house and the principal parts of the park or pleasure ground; neither must we entirely shut out from view the whole of the ends or boundaries of the outward prominences, or some of those parts which project into the water. At the same time caution must be used not only to prevent the eye from catching the various bends of the outline of water from any one point of view (which would be bad), but also so as to afford variety in the grouping of the trees and shrubs; indeed, the whole planting must be so effected as to leave the extent of the water undetected, and even unimagined, from any one position. The following may be named as suitable for planting in the neighbourhood of water. Those to be employed as low growths in dressed grounds should consist of common Heath, Ferns, double Ayrshire Roses, Sweet Gale, English Juniper, dwarf spreading Willow, Andromeda polifolia, Ledum palustre, and others. The Alder, kept low by occasional cutting, makes a fine fringe, and forms a strong barrier for the margins of water when the current is liable to wash away its banks. The common Whitethorn, Bramble, hedge Rose, red Dogwood, Honeysuckle, and Blackthorn, afford proper marginal decoration for water in natural scenery. Trees suitable for dressed grounds may be of various kinds. Those best adapted for positions nearest the water, where the ground is liable to be moist, must consist of the common Alder, various kinds of Willow (including the Weeping and Rosemary-leaved Willow), *Alnus cordifolia*, Norway Spruce, deciduous Cypress, and Hemlock Spruce. Such plants are also quite proper for the islands; but in order that the roots may not lodge too much in the water, the parts of the islands to be planted should be raised irregularly, or in a natural manner, with stones, roots, sods, &c., mixed with suitable soil, a few feet higher than the level of the water. The five last-named kinds of trees are most appropriate for beautifying water in well-kept grounds. Amongst the larger trees employed, not exactly fringing the margin, but at a moderate distance from the water, the Wych Elm is the most elegant, and should always be planted in extensive places; its elegant massive twigs and pendent branches entitle it, above all other large trees, to this distinction. Nevertheless, the English Elm, Lime, Beech, Weeping Birch, and Larch, would be appropriate. Every kind of Poplar should be excluded, except, indeed, the Lombardy, of which two or three may be planted so as to rise out of the midst of masses of other trees. In planting, room should be allowed for walking near the water's edge; sometimes close to it, and at other times with a bush or group of shrubs interposing. Swans, by all means, must be introduced, as well as other water fowls.

Effect of the Winter in the Edinburgh Botanic Gardens.

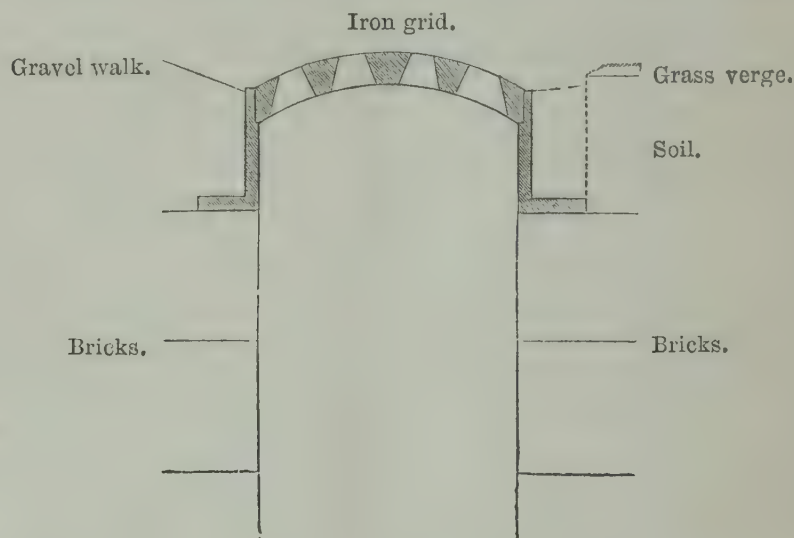
—Mr. M'Nab states that some plants in the Edinburgh Botanic Garden have suffered considerably from the effects of the past winter. A few points of some of the Cupressineæ are observed to be a little browned, particularly in low situations. The leaves of the Golden Queen Holly are also much discoloured. The green Hollies, particularly the tree forms, have parted with a large quantity of their leaves. The *Phormium tenax* or New Zealand Flax, as well as the *Cordyline angustifolia*, have suffered severely. Many of the latter plants have stood unprotected on the rock garden during the last five years, some having attained the height of 6 feet. During December, 1870, the frost was so severe that several of the *Cordylines* at that time were killed to the ground, but they again pushed up from the lower portion of the stem, and afterwards became fine plants; hopes are therefore entertained that the injured specimens will all break out again, the plants being considerably stronger than they were when last damaged.

Terrestrial Radiation.—Professor Dyer made the following communication the other day to the Scientific Committee of the Royal Horticultural Society, basing his remarks upon the observations of Mr. Buchan:—"The effects of terrestrial radiation are at

the maximum when the air is calm and very dry, and its temperature rather low. If, however, the cold air produced through the influence of terrestrial radiation be allowed to accumulate close to the ground, no small amount of damage may be done by a comparatively slight frost. On sloping ground such accumulation of cold air cannot go on, because cold air being heavier than air which is warmer, as soon as the air in immediate contact with sloping ground is cooled, it flows down to a lower level, just as water would do, and its place is taken by the warmer current of air immediately over the downward-flowing cold current of air. In this way a higher night temperature is maintained in situations where the ground slopes down to lower levels, and accordingly such situations should be chosen for those plants which, at any stage of their growth, are peculiarly liable to be injured by frost. If the air be not calm, but a wind—even a slight wind—be blowing, the different layers of air are thereby mixed; and thus the air, cooled by contact with the cold ground, is not suffered to rest on the ground, but is mixed with the air above it, and the temperature is thus prevented from falling so low as it otherwise would."

DRAIN GRATINGS FOR GRAVEL WALKS.

I THINK your correspondent, Mr. Sheppard (see p. 155), will find his style of grid capable of considerable improvement. As I am constantly using large quantities of grids in laying out and altering gardens, &c., I have paid a good deal of attention to the subject, and find, in practice, that the plain grid recommended by Mr. Sheppard requires great nicety in fixing upon the brickwork, and is very liable to be displaced when ramming the gravel. In course of time the cesspool or eye is apt to be filled with leaves, &c., washed off the walks; then the grid, cast in one piece or rivetted together,



Scale: 2 inches to 1 foot.

must be pulled out, necessitating considerable disturbance of the gravel. To meet these objections, I have a grid cast which I now almost invariably use, and of which the accompanying is a section. The grating and box are cast separately, thus allowing the former to be lifted out at any time for the purpose of cleaning out the cesspool, &c., without disturbing the surface of the walk. The projecting flange round the bottom of the box or frame increases the bearing surface so much that any ordinary labourer can readily fix it upon the brickwork without chance of displacement. I have also discarded the old form of hollow or flat gratings, finding that a heavy shower often chokes them up with rubbish, whereas the arched form shown in the section is not liable to this defect, and is also much stronger.

J. H. CARRINGTON.

Mile End Nurseries, Stockport.

THE "SATURDAY REVIEW" ON QUEEN ANNE'S FLOWERS.

PARLIAMENT has met, Rotten Row is filling, Valentine's Day has come and gone, the birds are beginning to sing, but even "the inquiring bee" could scarcely find a flower in Hyde Park. In August, when every one is out of town, and empty chairs are all that remain to remind us of the gay toilets and crush of the season, the beds from the Marble Arch to Stanhope Gate will be in the full blaze of their gay, if not altogether harmonious, colouring. When in November people begin to return, these beds will be mounds of dark empty earth, giving passers-by a shudder as they liken them to uncared-for graves. In his delightful essay "Of Gardens," Bacon says, "I doe hold it in the Royall Ordering of Gardens, there ought

to be Gardens for all the Moneths in the Yeaere. In which, severally, Things in Beautie may then be in Season." But few modern pleasure-grounds are managed on this sound principle, although with the numberless plants and the rich variety of flowering and berried shrubs now added to our list, it ought to be much easier to arrive at the acme of good gardening than it was two hundred and fifty years ago. In those days gentlefolk were content to live all the year round in a country house. There was no social pleasure to force them to spend the sweetest months of spring and early summer in crowded streets and heated ball-rooms. A family tour on the Continent was arranged years before, and talked of years after the great event had been accomplished. The lives of those prosaic folk were still endurable to them although they had no shooting-box in the Highlands, no yacht in the Mediterranean. But now the "prince-like" gardens of which Bacon speaks, and which, he says, ought not to be less than 30 acres in extent, have to be managed on totally different principles. The great aim of an intelligent and experienced gardener in these days is to produce his best show in whatever season, be it spring or autumn, the family chance to be at home. This is by no means difficult to accomplish, although one may constantly see fine places where such an obviously necessary plan does not even seem to be attempted. It would, of course, be most unreasonable to expect the Board of Works to know at what time London is full, or during which months it is empty. For all we know to the contrary, the gardening in the parks may be for the benefit of country tourists. It would be unfair to ask men already overworked to remember that this is precisely the season of the year when a generous display of even the commonest flowers, provided they were bright in colour, would be acceptable to Her Majesty's subjects. Competitive examinations certainly do not include gardening amongst their subjects, although a useless knowledge of botanical terms is not uncommon amongst young men. But every one must have felt at some time in his life how, with the lengthening of the days, comes a desire to see things growing. It is now that we watch with impatient interest the snow transforming itself into Snowdrops, the icicles growing into catkins, the Crocuses returning with interest every ray of sunshine, though it be given grudgingly and through tearful clouds. When the east wind blows, they shelter themselves in their spiky sheaths, but are ready to open their glowing breasts at the faintest invitation from the west. It is now that we welcome the purple flush of spring on the Beeches, the wakening of the Daisies, the sprouting of the Grass, the bursting of the Lilac buds. But in the parks we must for the present be content with a few scattered Crocuses supplemented by Orange peel. We look in vain for the Hepaticas which ought to be popping their little pink or blue noses out of the ground, for the single Anemones, scarlet and purple, with which French and Italian Vineyards will shortly be carpeted, for the winter Aconite, and the hardy crimson Primroses. There are no pots of early Tulips, no patches of spring heath, no dwarf blue Scillas. We do not see any Grape Hyacinths or Dog's-tooth Violets appearing. Even if these plants had to be raised in pots it would be at no great expense or trouble. They could be easily removed when out of bloom, and replaced by other things in their season. Then, too, it would surely not be unreasonable to ask that in the borders that skirt the railings, and amongst the clumps of shrubs, there might be planted plenty of Daffodils which "come before the swallow dares," and an abundance of winter Violets, Snowdrops, and Narcissi. Unfortunately, the neglect of spring flowers of which we complain is not confined to the managers of public gardens; it exists wherever gardeners have their own way. They hate spring flowers, because they interfere with the only things gardeners think fit for a gentleman to look at—bedding-out plants. It is odd to see how these foreign plants have now almost ousted the flowers of our grandmothers' days. They appeal to the vulgar love of garish colour, they suit the taste of the people who buy tartan shawls, they are admired by those who do not think their dress perfect without the help of both a good red and a good bright yellow, and plenty of them; but, above all, they have been the fashion for the last ten or fifteen years. It is often amusing to trace a fashion as it percolates downwards. By the time it has reached the far-away sleepy country villages, something quite new and entirely opposite is really the rage amongst the upper ten thousand. Cottagers now try to fill their little plots with Geraniums and Calceolarias, which they are obliged to keep indoors at great inconvenience to themselves and loss of light to their rooms. Meantime my lady at the Court is hunting the nursery grounds for London Pride and Gentianella to make edgings in her wilderness, and for the fair tall Rockets, the Cabbage Roses, and the nodding Columbines, which her pensioners have discarded and thrown away. The disappointed gardener at the Court sees the border which he had destined for the last new and most hideous pattern of ribbon bordering turned into a lovely plantation of Lilies and Larkspur, Pentstemon and Phlox, all allowed to grow at

their own sweet will amongst hardy and sweet-scented shrubs. The beds in which he had intended to imitate as nearly as possible an oilcloth pattern are, to his horror, filled with pearl-powdered Auriculas, and Daphne Cneorum; while "Many a Rose Carnation feeds with summer spice the humming air," and blue Salvias and tree Peonies mingle with Honeysuckles and Poppies. If he has any regard for his reputation among his fellows, he will throw up his place, however much his wages may be raised to compensate his feelings for such a state of things. Thank goodness, the days of ribbon borderings and oilcloth patterns are numbered. For once, fashion has done something to encourage natural beauty and true art. We rejoice heartily, so far as the science of gardening is concerned, at the new turn of the wheel which has given us back those dear old flowers. Queen Anne has come to her own again, and the train of faithful and enthusiastic subjects with whom she has returned bring in their hands proud Turncap Lilies and stately Hollyhocks to plant against a background of moulded brick or melancholy Yew. They troop into the panelled rooms of her houses, bearing in their hands creamy white vases filled with Lavender and Lupin, which they place on emaciated tables to harmonise with the dove-coloured curtains and the straight lines of the uncomfortable sofas. They plant Passion-flowers round the porticoes and train the Musk Roses, despised but yesterday, to mingle with the ghostly Juniper, and to blush as the inhabitants look at them through the square-paned windows. We may now hope again to see lovers walking in "Alleys Spacious and Faire, hedged at both ends to keep out the wind." They will stop and look at the "Heapes," "some with Periwinkle, some with Pincks, some with Sweet William red," and they will gather "the like Low flowers, being withal Sweet and Sightly." We shall also, if Piesse and Lubin have not entirely destroyed our natural taste by their artificial productions, take care that there are aromatic herbs in our pleasure-grounds, because "the Breath of Flowers is farre Sweeter in the Aire (where it comes and goes like the Warbling of Musick) than in the hand." Bacon goes on to remind us of many a fragrant plant, and speaks of "Strawbery leaves dying which yeeld a most excellent Cordial Smell." We know of other Strawberry leaves which are also a "cordial" of the most esteemed kind in these latter days. Our grandmothers did not despise a posy of Gillyflowers and Balm of Gilead, and lovers sent each other "Rosemarie for remembrance," which was considered comforting to the brain and strengthening to the memory before Perdita put it into her garlands. The truth is, our grandmothers loved and superintended their gardens; they gave to them that air of individuality and refinement without which no drawing-room, no pleasure-ground is perfect.

Medicinal Rhubarb Grown in England.—I pointed out your remarks (p. 148) upon Turkey Rhubarb to a friend of mine, who, with myself, had always believed that *Rheum palmatum* was the source whence the drug was derived and not *Rheum officinale*. It would appear, now, that we were right; but, surely the question might easily be set at rest once and for all. It could not be a matter of much difficulty, one would think, to ascertain what plant produces so well-known a medicine as Rhubarb. My own impression is, that what is known under the name of Turkey Rhubarb is the produce of more than one species of *Rheum*; for I happen to know a person who has made a comfortable little fortune by growing the medicinal Rhubarb in England. Passing through a part of Oxfordshire last November, I saw in a district where the red soil charged with iron seemed excellent in quality, some fields in which there were strange-looking vegetable remains. These, upon closer inspection, proved to be the decayed flower-stems of Rhubarb, and, on further enquiry, I found that the fields in question were what were called celebrated Turkey Rhubarb grounds. I obtained, through the agency of a friend, some fine roots from them, and shall therefore be able to ascertain what Turkey Rhubarb grown in England really is. With the roots I also received a quantity of the prepared article—enough, in fact, to stock a small druggist's shop. Quantities of the Rhubarb from these grounds are sent to France, Belgium, and other places. I am going to have it tested and compared with what is sold as Turkey Rhubarb at a chemist's. Some of the dried pieces sent to me are 12 inches in circumference.—T. WILLIAMS.

Cement for Iron and Stone.—Glycerine and litharge stirred to a paste hardens rapidly, and makes a tolerable cement for iron upon iron, for two stone surfaces, and especially for fastening iron in stone. This cement is insoluble, and is not acted upon by strong acids. Cloth can be cemented to polished iron shafts, by first giving them a coat of best white-lead paint; this being dried hard, coat with best Russian glue dissolved in water containing a little vinegar or acetic acid.—"Iron."

TREES AND SHRUBS.

SKIMMIA JAPONICA AND FRAGRANS.

SKIMMIA JAPONICA, Thunberg tells us, was for a long time the only variety known to us. Now, however, we have at least five recognised species, viz., *S. japonica*, *oblata*, *Veitchii*, *laureola*, and *fragrans*, of the first and last of which we furnish illustrations. *S. japonica* is



Skimmia japonica.

valuable on account of its brilliant red fruit, about the size of a Pea, which, growing in profusion, remains on the bush all the year round, thus giving it a very ornamental appearance, especially in winter, and perhaps not less so in the following spring when, through this strange tenacity of adhesion, it is not unusual for the plant to



Skimmia fragrans.

be seen, as in our illustration, laden both with fruit and flowers at the same time. *Skimmia fragrans*, which bears a sweet-smelling white flower tinged with yellow, possesses this peculiarity—that though its buds appear before winter sets in, the flowers do not open till the following April. With the exception of *laureola*, which is indigenous to Nepal, all the varieties of *Skimmia* come from Japan; they are well worthy of extended cultivation, being very hardy and

adapting themselves readily, when young, to almost any soil or climate. They may be easily increased by means of cuttings struck under glass, or in some cases from seed. Siebold and Zuccarini state, says the "Revue Horticole," that the Japanese and Chinese class *S. japonica* amongst poisonous fruits.

More Great Australian Trees.—Baron Mueller, government botanist, Victoria, in his last report gives some interesting details of the results of recent explorations in the Upper Yarra, Hume River, and other districts. In the forest regions of the Upper Yarra and the southern branches of the Goulburn River, measurements were taken of some of the larger trees of *Eucalyptus amygdalina* var. *regnans*, the highest being approximately 400 feet, but it is believed that there are higher specimens, which, however, could not be measured on account of the labour of clearing away the dense jungle to get a base line. The magnificent Grass, *Festuca dives*, first discovered in West Gippsland, was found in the same districts. This Grass grows from 10 to 12 feet high, or even as to much as 17 feet in the rich soil of the Fern-tree gullies. A list of new additions to the genera of Australian plants during the year numbers fifty.

Destruction of Rome's "Garland Forest."—In Mr. Augustus J. C. Hare's book, "Walks in Rome," recently published by Dolby & Son, he alludes to the insensibility to, and want of appreciation of, landscape, sylvan, and horticultural beauty manifested by the Roman municipal authorities in carrying out recent improvements. The Villa Negroni Massimo, the most beautiful of Roman gardens, with the grandest of old Orange avenues and glorious groves of Cypresses, amid which Horace was buried; a villa whose terraces dated from the time it belonged to Mæcenæ, and which was replete with recollections of the romantic story of Vittoria Accorambuoni, of Donna Camilla Perretti, and of Alfieri, has been ruthlessly and utterly ploughed up, so that not a trace of it is left. "Even this, however," Mr. Hare goes on to say, "is as nothing, compared with the entire destruction of the beauty and charm of the grandest of the buildings which remain. The Baths of Caracalla, stripped of all their verdure and shrubs, and deprived alike of the tufted foliage amid which Shelley wrote, and the flowery carpet which so greatly enhanced their lonely solemnity, are now a series of bare, featureless walls, standing in a gravelly waste, and possess no more attraction than the ruins of a London warehouse." Then with regard to the Colosseum he writes, "The Colosseum, no longer 'a garlanded ring,' is bereaved of everything which made it so lovely and so picturesque, while botanists must for ever deplore the incomparable and strangely unique flora of the Colosseum, which Signor Rosa has caused to be carefully annihilated, even the roots of the shrubs having been extracted by the firemen, though in pulling them out more of the building has come down than five hundred years of time would have injured."

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The Huon Pine hardy in Wiltshire.—I find this Conifer to be quite hardy; we have a specimen of it here about 24 feet high; its habit is slender, but very graceful.—GEORGE BERRY, *Longleat, Wilts.*

Fertilising Aucubas.—The bloom buds on our male *Aucuba* are very forward and will soon open, while those on the female are still invisible. Can I do anything to check the former? It is in the open ground.—J. H. W. THOMAS, *Carlton*. [Secure the pollen when the flowers open, and keep it in lead paper until the female blooms are ready to be fertilised.]

Fine Cupressus Lawsoniana.—The finest specimen of this handsome Cypress that I have seen is in Mr. Pearson's pleasure grounds at Chilwell. It was planted a sapling in 1853, but is now 20 feet high and 30 feet in circumference close to the ground, although this width is carried up to within a foot or two of the top, its symmetry is very perfect. This particular tree appears to be more hardy than others of its kind at Chilwell. It seems, indeed, to be endowed with a Siberian constitution.—J. MUIR.

The Mammoth Tree in the Atlantic States.—Mr. Meehan says, in his "Gardener's Monthly," that the Mammoth tree has not proved a success in the Atlantic States. It gets diseased in summer, and after a few years dies away. Of hundreds set out around Philadelphia, he only knows of one living now, and this is sheltered from the summer sun by tall white Pines. No winds or frosts have hurt it. The cool shade, however, keeps the summer complaint from being rapid enough to destroy it. Three-fourths of the lower branches are killed; but it seems to keep a little ahead of death.

When Should Hollies be Pruned?—What is the best time to prune and cut into shape a large Silver Queen Holly that has been neglected for three or four years, and sadly wants bringing back to its lost pyramidal shape. My own opinion is that it should be done in March, but I fear committing a blunder that may be disastrous to a splendid tree 25 feet in height.—HIN, *Bromsgrove*. [I have no hesitation in recommending your correspondent to cut in his Silver Queen Holly at this season. I have pruned Hollies both in spring and autumn, and never found any bad effects to be the result. After the operation, darken the cut extremities of the branches, stir up the surface of the ground with a fork, and place some good rich soil over the roots. The cutting in of many of the Hollies in this garden (to make them assume a pyramidal shape) was done about a fortnight ago.—JAMES McNAB, *Royal Botanic Garden, Edinburgh.*]

PROF. NEWMAN ON FRUITS AND VEGETABLES AS FOOD.*

At the editor's request, I begin this article with a few words on my personal experience of vegetarianism. I was led to study the question during the first cattle murrain, and approached it on the side of political economy and for avoidance of disease among the poor. I did not at all believe it could suit me personally, yet was ashamed to talk or write in favour of it without at least trying it. Upon trial I soon found my digestion to improve—carefully rejecting white bread, and getting the brownest which was to be had. I had previously, by medical order, eaten flesh meat regularly twice a day, and rather largely. Dinner pills were ordered me to assist digestion of so much meat. These I abandoned with flesh food, and have never resumed them. My general health is better than I can remember it, nor has my enjoyment of food at all lessened. In my seventieth year I need neither doctors nor medicine. By general testimony the colour of my skin and fulness of my cheeks have much improved under this diet, which I would now on no account give up, though I adopted it with much more of fear than of hope. The increased price of flesh meat has become an untractable fact, distressing to the gentry who cannot increase their income, and to thousands of small households in our vast trading community. To the artisans who have acquired habits of flesh-eating in the last twenty-five years, it neutralises the advantage of their higher wages, even when they are abstinent or very moderate as to intoxicating drinks. Necessarily then, the whole question of this diet is coming forward into fuller discussion, and interests thousands who a few years ago never gave continuous or attentive thought to it. There are three main topics, on one or all of which those who assume the name Vegetarians base their abstinence from the flesh of animals:—The argument of economy (private or national); the argument of physiology—which bears on health, longevity, and even moral temperament; thirdly, the argument from the rights of animals. To different minds these arguments bear a different scale of importance. Naturally, to statesmen the argument of national economy, determining the population which a given area of soil can feed, will seem primary in this question; but to those who, not through poverty, abstain from flesh food, the other arguments will generally take the lead. The author of the classical work on "Fruits and Farinacea" was brought to renounce flesh meat from being led to study the basis of our rights over the lives of animals. He came to the conclusion that without decisive and urgent necessity we have no right to deprive harmless animals of life; and on pursuing his enquiry further, he convinced himself that to feed on their flesh does not conduce to superior health, strength, or longevity, but contrariwise. Beginning from this side of the subject, he worked out the whole of it, so that it is hard to say which of the three topics he regarded as the principal one. The late Mr. Brotherton, long distinguished in Parliament as the Vegetarian member, and signalised for vigour in advancing years, certainly gave no practical prominence to the economy of vegetarianism; and probably, like Mr. John Smith, was allured to it on what may be called the Brahminical side, by the tenderness of his nature and his strong sense of universal justice. One might gather from the comments of the public prints on the vegetarian festivals of those days, that the leading vegetarians some twenty years ago were more anxious to convince rich men what luxurious repasts they could give, without flesh food, by elaborate cookery, than to show to poor men—and to all who desired to spend as little as might be on lower appetite—how simple and cheap is a satisfying vegetarian fare. Of course, it is possible to be as extravagant on one form of cookery as on another. There is no upper limit. It is only concerning the lower limit that there can be any available discussion.

The topic of health and longevity is naturally prominent with all vegetarian physicians. Dr. Lambe, in the past generation, gave a life-long adhesion to this practice, and an enthusiastic advocacy of its excellence. Before him Dr. Cheyne, of Bath, though less consistent and thorough-going, gave very remarkable testimonies, especially to the efficacy of vegetarian diet in chronic diseases. It must at once appear how many important enquiries crowd in, as soon as the relation of diet to the health of invalids is touched. While men and women are in rude health, and live simply, without excess, the stomach digests with seeming indifference a vast variety of food. Whatever can nourish appears to be healthful, and all scruple about the kind of food sounds like pedantry or superfluous care. Not so with invalids. Not so with those who live a sedentary life—those who disproportionately use the brain—those whose nervous system is overstimulated—those who have no full and regular muscular action. In these health cannot be robust and rude; and if food less natural to man—that is, less completely suited to his organisation, be used, one may reasonably expect frequent damage to health and some shortening of life unawares. When it is manifest how large a frac-

tion of English diseases among our middle and upper classes arise from the stomach, diet must assume a first-rate importance with physicians; though it is said (probably with truth) that our townsmen and our upper classes, and the servants of the rich, suffer far more from excess in quantity than from any error in quality. With such complexity in the questions concerned, there is evidently room for great variety in the details of vegetarian practice. We might expect, what indeed we find, a few vegetarians rigid in the extreme. The late Mr. George Dornbusch, of Threadneedle Street, went even beyond vegetarianism. He not only abstained from all the received animal foods—from everything that had had animal life, and from eggs, milk and its products, but from every form of vegetable grease or oil, from the chief vegetable spices, such as pepper and ginger, and emphatically from salt. The present writer, in a long conversation with him, entirely failed in discovering, beyond the argument that salt is a mineral, any other ground for these abstinences than that they agreed best with him. He took only two meals in the day, and could boast of unbroken health in very continuous business. On one remarkable occasion he was assailed in the street by an escaped lunatic, who stabbed him in twenty-three places. He went into the first chemist's shop, and got his wounds bound up. Loss of blood caused him much weakness, forcing him to be absent from business for a fortnight; but he wanted no medical advice, nor any drugs: every wound healed easily, and he was soon perfectly recovered. Finally, through too much trust in the strength of his constitution, he exposed himself unwisely to cold when already suffering from bronchitis, and the hot bath did not save him from being carried off in the midst of vigorous life. Another gentleman informed me, that without knowing that there was a Vegetarian Society in England, or being acquainted with anyone who followed their tenet, he once lived for three years on fruits only, and is convinced that at no time in his life was he so strong; but he gave it up from the inconveniences of the practice. A few vegetarians (only a small fraction of those known) abstain from milk and eggs as severely as from beast, bird, and fish; some, from the desire to carry a principle through so completely as to avoid all cavil; others, from the consideration that so long as there is a demand for milk male calves and oxen will be killed for the table, and probably the cows also before they pass middle age.

Another possible form of abstinence is regarded by the Vegetarian Society as far too imperfect to be recognised at all or to deserve a name; yet there is no compromise so likely to be widely adopted by our nation as that alluded to, viz.: to abstain from quadruped and fowl, but accept fish and marine animals. Inasmuch as no pure vegetarians can reasonably hope that a nation long accustomed to flesh-meat will collectively change its habit, except in the course of several generations, this imperfect form of abstinence might seem to deserve their warm encouragement. Fish do not occupy arable land. Fish have no family life or family affection. To take one life does not torture another. They are, themselves, nearly all fish-eaters. Our capture of them generally is, and ought always to be, painless. If it be admitted to a severe vegetarian (what is hard to prove) that to eat a fish-dinner once a week somewhat shortens life, yet perhaps no vegetarian will assert that the use of marine sauces, or of caviar, or of isinglass, has any such tendency. Hence a diet, such as poorer men would naturally take, resorting to marine products rather as an aid to cookery than for the substance of food, appears to reduce the objections of vegetarians to a minimum. I may be permitted to dwell a little on this topic. While on the whole, to any family of the gentry or of thriving shopmen, a vegetarian diet which admits milk and eggs sparingly may be far cheaper than one into which butchers' meat, pork, fowl, and fish freely enter, those who are a little poorer find gravy and fats hard to dispense with, because of the high price to which good butter is run up. Suet, indeed, itself is dear, good oil is dearer; mustard oil might, perhaps, be very cheap, and is largely used by the poor in India; but at present bacon-fat, lard, and dripping have strong hold of the common imagination; moreover, such articles as sprats, bloaters, herrings, and sauces made of marine animals, give either strong taste or oiliness to many forms of food which, unless skilfully cooked and seasoned, are judged mawkish. Instinct is quite right in demanding flavour, and a fair supply of oleaginous material. The poor, nay, the whole nation, has yet to learn how to cook well and with least trouble. It is new to the present generation of English workmen to have butchers' meat even once a day; a little wise persuasion may induce many to abstain from it on principle, as their fathers did from necessity; but to refuse not bacon-fat only, but also red herrings, bloaters, and sprats, is a still harder thing for those who cannot afford butter—who have no supply of savoury herbs, and no experience in cooking. If any mass of our workmen could be induced to adopt the more moderate abstinence of accepting the animal produce of the seas, but refusing that of the land, many of the most valuable results claimed by

* From "Fraser's Magazine" for February.

vegetarians would be obtained. Besides, if the principle of studying what is the best food once gains ascendancy, the more severe rule surely wins on the laxer. But even by the laxer rule we should reverse the error made from 1847 onward. In 1845 and 1846, before the actual repeal of the Corn Laws, it was predicted by Colonel (General) Perronet Thompson and Colonel Torrens, advocates of the repeal, that one result would be a great increase of demand for butchers' meat, dairy produce, and garden vegetables, by which the farmers would grow rich. So it shortly proved. As fast as wages rose in the towns through increased commercial prosperity, the artisan population consumed more and more of flesh meat. By a coincidence no doubt accidental, in 1847 the Vegetarian Society was formed, and year by year proclaimed to the multitude the wisdom of saving their money by a more economic diet, which was on several other grounds far better. But the newspapers treated them with ridicule; the medical practitioners and the employers of navvies zealously preached up butcher's meat; the mass of the nation never had the arguments brought before them; the rush after flesh-meat continued, until murrain after murrain resulted among the cattle; panic followed; public slaughtering was commanded, in order to "stamp out" the disease; prices already high, were hoisted higher and higher, until many began to ask whence this had arisen, and in what it would end?

No effort is here made to exhibit the immense mass of broad facts, based on the state of whole nations, which proved decisively that vegetarian diet is able to produce the maximum of human strength. As usual, men pretending to science quote cases of navvies who worked better on rumpsteaks and such-like narrow experiences, which always admit a simple solution:—"Pay men better, and they work with a hearty will: pay them better, and they also rush into sensual indulgence." But these overfed navvies are not healthy. The tale of them is that of athletes according to Aristotle, who were wholly unsound, because they "over-ate and over-worked." The reader must be referred to the pages of Mr. John Smith, of Malton, or rather to its abridgment by the Vegetarian Society, for the abundant evidence of the remarkable strength of nations who feed on grain and other fruits of the earth. Hitherto, as has often perhaps been remarked, the rich eat whatever they like, and the poor whatever they can get; few, indeed, appear to have made the enquiry, either morally or physiologically, what is best for a nation to eat? On the other side of the Atlantic we have a warning to what our national habits tend. In the American Union physical abundance has long reached the lowest class; butchers' meat is eaten as often as they please by the population in town and country; and no part of the English race is so unhealthy as they. Stomach-ailments, and nostrums to relieve them, abound there as nowhere else; a prevalent haggard aspect seems to tell of unsound nourishment; but, possibly, over-work of brain may in many cases conspire to the result. In Australia, some allege, the Yankee type of countenance already appears: but all is too new there to rest an argument on. In New York and the neighbourhood, in order to get a sufficient supply of milk, the cows are fed on the refuse of distilleries, by which the quantity of the milk is increased, and the quality deteriorated. Moreover the cows, confined in cellars, become emaciated and diseased. Such are the mischiefs which our artificial modern contrivances entail.

A second evil of the great demand for butchers' meat and dairy produce is, that the high price makes it worth while to restore cultivated land to Grass. The farmer saves the wages of tillage, of weeding, and of gathering crops; yet one cannot tell, *a priori*, whether he would prefer to devote the fields to crops for the consumption of cattle, and (perhaps) keep the animals in stables. But it is sufficiently testified in the Government Blue Book that in Ireland land is now given back to Grass, in order to rear more cattle and sheep. Hereby the soil is rendered immensely less productive of human food. The rustic population are less needed, and must be driven into towns to compete for work, or swell the ranks of paupers or emigrate to enrich other soils; while our towns become more and more dependent on the foreigner for food. This stage of national existence, denoted by overgrown towns, and rural places occupied by many cattle and few men, strongly marks the period of decay, and cannot too soon alarm us. But it will be observed, that whether a population eats or does not eat fish, neither usage promotes any of the evils which (in our present national stage) attach to a general coveting of butchers' meat. The supply of fish is just so much added to the national food, without using up an acre of cultivable land. It cannot cause displacement of rustic labour. Dead fish may, no doubt, be sold when unwholesome; so may vegetables; but to beware of each evil is comparatively easy. The fish is ordinarily brought to shore alive, in a perfectly natural state, in its own element. Hitherto, however, most fish is far too dear for the consumption of the millions. The argument here pressed is simply that, from the vegetarian point of view it is of comparatively slight importance at the

present crisis to induce the mass of the people to forswear fish as such. Few of them will get any other fish than sprats, skates, and, at certain times, mackerel and herrings; indeed, except near seaports, the supply will be generally confined to salted articles. If a pledge conduce to steadiness of conduct (as many find it does) it would seem expedient to have a series of pledges varying in stringency, so that each may select that which his circumstances allow him to carry out. But we turn now to a side of the subject which must grow in importance—the supply of milk. It was mentioned that the Vegetarian Society, while condemning suet and gravy, distinctly permits the use of milk, butter, and cheese. But milk and butter, alas! are now most difficult for our rustics to obtain. The railroads give facilities of transport, and the towns buy up the dairy produce wholesale. In many places it is a certain fact that farmers contract to supply so much that they have little or nothing left to sell to their own neighbours. If to Potatoes buttermilk can be added, an Irishman gets all that Nature needs; but if not even buttermilk can be got, Potatoes are not a sufficient food, nor is brown wheaten bread by itself palatable, unless it be in its prime of excellence. Charitable persons have been known to purchase preserved Swiss milk, dilute it with the due proportion of hot water, and sell it, as a charity, to our peasants, who otherwise had no chance of purchasing milk at all. When such facts raised the enquiry, "Could not our rustics have cows of their own, if a run for them were allowed?" the thought moved a nobleman, whose philanthropy we do not call in question, to abrupt laughter, so absurdly impossible did he regard it. Yet in other countries it is not impossible; and even in Scotland some large farmers deem it for their interest to allow cow-pasture to their labourers. Over the peasant's inability to get meat-fibre as food, it is not necessary to mourn; but the deprivation of even skim-milk and buttermilk is a very serious fact which urgently calls for remedy. Even wandering Arabs and Turcomans, who rarely taste flesh, account milk and its products a very important part of food. That our greedy towns should be able to buy all up, and leave the peasants empty, is a national scandal. Evidently the milk ought in some sense to be in the peasant's own hands, so that he may have the option of detaining it for the use of his family.

It is generally imagined that in vegetarian cookery great quantities of milk and eggs are necessarily used. This is a gross mistake; and some vegetarians do not use these articles at all. Still, it is unfortunate that, when they are not entirely renounced, it is always open to opponents to assert that they are inordinately used; and this often is asserted very broadly, though without any attempt at proof, proof and disproof being alike difficult. The assertion springs out of two erroneous assumptions—(1) that there is in every vegetarian a craving after the nitrogenous element supplied by the lean of meat, by milk, and by eggs; (2) that the supply cannot be obtained from purely vegetarian food. The second error ought not to be made in the present state of science. For more than twenty years it has been notorious, and conceded beyond controversy, that the gluten of wheaten brown bread and of barley is chemically identical with albumen; that is to say, with the substance of flesh meat; also that Beans, Peas, and Lentils are richer in nitrogen than is lean beef itself. The purest vegetarian does not need to suffer from any deficiency of nitrogenous food, and vegetarians in general steadily deny that they have any craving for such food. Indeed, it has been in more recent years ascertained that the nitrogenous or flesh-forming element is of immensely less importance than the heat-giving element, for the latter is that which gives vital force. If a man works very hard, he somewhat wears away the muscular tissues, on which account he needs a little more of albumen; but the exhaustion of vital force is by far the graver drain upon him, and, even when we work least, there must be large expenditure of the latter kind. Starchy and oily substances supply heat and force; and these substances abound in the vegetable world. If any vegetarians are extravagant in milk and eggs, it is not from any craving of their stomachs, but from excess of zeal or ignorance in their cooks. In every house of moderate wealth, the cook likes to make her dishes highly palatable, and will probably be lavish in the use of these popular delicacies, unless steadily checked by the mistress. To the present writer, ever since he has adopted vegetarian practice, it has been matter of conscience not to increase his use of eggs and milk—of milk especially; because, to make a run on it, involves all the same evils as to make a run on butchers' meat. In fact, if anyone can reconcile himself to the use of oil in cookery, there is no difficulty whatever; otherwise, there is probably a necessary increase in the use of butter in preparing vegetables when other animal fats are refused. Different vegetable oils have, no doubt, different flavours; and a little more experience will teach us how, by a slight addition of vegetable acid or of some savoury herb, any taste of an oil offensive to an individual may be corrected. Skim-milk, buttermilk, and cheese retain the nitrogenous element; hence, added to Potatoes or

bread, they make very complete human food. In buying up the country butter, the towns do not rob the rustics quite so cruelly as when they take the milk itself; still, it is very inexpedient and essentially unfair. If vegetarians are to hold up a noble and profitable example to others, they must not only jealously restrict their own consumption of milk and its products, but ever be aiming to lessen it. The argument on this side would become prudential and personal, if we could believe that the statements about pestilential milk which have had currency in our newspapers point at any general facts and soundly expound principles. Cows, it is said, were fed on unwholesome Grass (and were not visibly and at once made ill); but their milk instantly became pestilential, and whole families suffered mysterious disease from it. There has been plenty of unwholesome water and herbage too, in all past ages, to do cows harm, if their instinct did not avoid it. Have our cows suddenly lost skill in the choice of food? When, by an excessive use of liquid manure, the Grass of a meadow has been made pestilential, if cows, through hunger, eat it, and it be poisonous to their milk, must it not first be poisonous to their blood and quickly alarm the cowkeeper? Do men wish to poison their own cows? or, can they do so, and be blind to the fact? One may be pardoned some incredulity, however respectable the medical authority which is said to have traced the evil home to its source.

To return to the question of national consumption, it is beyond dispute that, by an injudicious choice of food, a nation may starve upon a soil which is amply sufficient for it. Horses we keep, not to feed on, but for service. But oxen are no longer used for the plough or the cart, or very rarely—they are raised for food; and to get the same amount of human food through them needs three or four times as much land as would be required if we fed directly on crops of grain, pulse, Potatoes, or fruit suitable to our climate. So little are the minds of even educated people exercised on these topics, that ridiculous objections are constantly made by them. "How can you get nitrogenous food to make you muscular, if you do not eat beef and mutton?" asks one gentleman who has a smattering of chemistry. But how do the bull and the horse get their muscle without eating flesh? Evidently they get it, not only out of grain, but even out of Grass, to which our organs are not equal; but the element must be in the Grass, unless you admit they get nitrogen from the air by breathing; and if they can, so can we quite as well. "What will you do for manure?" says another, "if you do not keep cattle?" But if you return to the soil all refuse of plants, and, in short, whatever you take out of it, no exhaustion can follow. Exhaustion is caused if you send the whole crop clear away, as, not least, when you annually export herds of cattle. "The oxen would eat us up if we did not eat them," is also a common remark. But why, then, do not the horses, whom we do not eat, eat us up? Our graziers do their utmost to multiply the oxen, yet the objector is not aware that their number is now artificially great. In fact, the oxen may be justly said now to eat us up, for they lessen largely the number of men who can live from our soil. Our whole treatment of these cattle is quite against Nature. Fifty and a hundred years ago the employment of oxen for the plough was in many counties still kept up, and there is no adequate reason why, in the nineteenth century, and with an improved breed, all the heaviest work on a farm should not be done by the bulls, as it was in Virgil's day. High-bred bulls walk faster than heavy cart-horses, and might advantageously supersede them. If fondled from early days, they are quite gentle; and, what is more, they are stronger for draught than horses. The very form of the horse marks him as designed for swiftness, that of the bull for weight and strength. Give back to the bull his functions in agriculture, and you will not need to ask, "What can we do with him if we will not eat him?" any more than concerning the horse. While it is in many ways evident that for national economy—for a wise application of national resources—we ought to feed on the direct produce of the soil, the arguments of private economy come home more quickly to each man if only he have that confidence in general reasoning which some study of numbers and mathematics ought to give to all of us. For we have the positive testimony of the first chemists as to the vast superiority of grain and pulse, and dried Cabbage, or dried Cauliflower, and Nuts, and dried Apples, and Potatoes, to equal weights of dried meat; so that it is very easy to convince oneself that a flesh diet is the more expensive; indeed, when largely indulged in, it is a scandalous extravagance. But inasmuch as we are guided to food—not indeed by pure instinct, but by a habit which takes the place of instinct—and our taste generally demands what is habitual; most persons are incredulous as to unusual dishes, and insist that *soupe maigre* must always be a "meagre" thing, and that without, at least, meat gravies we could not have palatable dinners. Only the few have strength of mind to resist the tyranny of customary tastes. Yet it is certain that the zest of food mainly depends on a healthy stomach and a keen appetite; and that the vegetable world has

countless delicious flavours, far outnumbering those of the few animals whose flesh we eat. There is no basis for the prejudice which here is often so obstinate. To begin with broth: the broth from Peas, Beans, or Lentils, is far superior to that from mutton. The flavour given by Celery, with Onions or Leeks, to vegetable soup competes with anything that flesh can give. Mushrooms of several kinds surpass in delicacy and flavour the best of chops and steaks, which, indeed, often owe much to Mushroom ketchup or Horseradish sauce, or Tomatoes or Capers, not to mention pepper and salt, curry and spices. The very cheap savoury herbs, which the poorest person can command, are numerous—as Mint, Thyme, Lemon Thyme, Sage, Fennel, Balm, Sweet Marjoram, Horseradish; from which, with ketchup or Celery, compounds may be made, giving flavour to every combination of leaves or roots, or to grain and pulse, without thinking of milk or eggs, or even cheese. It is only prejudice and ignorance of cookery that keeps people incredulous. But for this very reason it is a matter of first-rate importance to have in every great town at least one vegetarian restaurant set up, with substantial and pleasant dinners, at a price not to exceed sixpence. This can easily be done, and would be done in a month's time, only that the Vegetarian Society is very poor, and cannot run risks with its narrow funds. In New York a philanthropic gentleman started such a shop, which is said to be a success; and there is every reason why it should be so, if a right selection be made of its conductor. He (or she) must be a thorough vegetarian at heart, zealous for the cause, as well as clever in business, and up to the mark in cookery. Such an establishment would have an immense advantage over an ordinary eating house, in the fact that grain, Potatoes, and pulse, which are the staple in vegetarianism, all keep a long time quite unharmed, while flesh is spoiled in a week. This is one of the causes which has made "licensed victuallers" degenerate into mere drink sellers. Beer and gin keep well, and meat does not. Of course, nothing but trial will convince the public how advantageous and satisfactory are vegetarian dinners, and there must be a risk, probably a loss, before an attempt succeeds, because, at first, things cannot go on by routine and order; judgment is constantly needed, when to make large purchases, how to select, for what to prepare; nor can it at first be certain what class of dishes and what form of food will be most popular. Philanthropy and wealth are often found closely combined in London and in our manufacturing towns. If a few rich men, anxious for the public welfare, would take this task in hand, consulting with the Vegetarian Society, they might soon have very gratifying success. It may be well here to name, that anyone without any pledge as to his diet, may become an Associate of the Vegetarian Society by a simple declaration that he desires to promote the diffusion of their literature, and by subscribing (as a minimum sum) 2s. 6d. annually to their funds; which will entitle him to receive the "Dietetic Reformer," their monthly organ. The patron of a vegetarian eating-house, by becoming an Associate of the Society would obtain their zealous co-operation; but, of course, would remain uncontrolled on his own ground.

In the course of last year a challenge was made and accepted in Birmingham, which bears directly on the subject now treated. A vegetarian, twitted by an opponent with the expensiveness of his cookery, declared that he could give a dinner to twelve persons for five shillings. The opponent nailed him to his word, and defied him to make it good. It had been uttered rashly, yet he proceeded to justify himself. The conditions were written down. The dinner was to be (1) satisfying to the appetite; (2) grateful to the taste; (3) not displeasing to the eye; the price of the articles was not to exceed five shillings, but the price of coals and cookery was not to be included. In the result, not twelve persons only, but sixteen, joined in the dinner. It consisted of soup, Potatoes, Vegetable Marrows, stuffed with Sage and Onions, and baked; Plum pudding, Apple pie, Damson pie, and small Damson tart. The company was abundantly satisfied, and the gentleman who had challenged was foremost in confessing that the three conditions had been honourably fulfilled. The bill was then produced, by which it appeared that the cost had been one halfpenny less than the stipulated five shillings. It stands thus:—15 lbs. Potatoes, 9d.; 2½ lbs. flour, 6½d.; ½ lb. butter, 7d.; Vegetable Marrows, 9d.; Sage and Onions, 2d.; Split Peas, 2d. Celery and Carrots, 1½d.; Apples and Damsons, 10½d.; Raisins and Currants, 6d.; Sugar, 3d.; Milk, 2d.; Candied peel, 1d.—Total, 4s. 11½d.

On reading the names of the dishes, it might seem that the sweet predominated over the savoury; but the expense shows nearly 3s. to the savoury and 2s. to the sweets. It will be remarked that the small sum of 2d. gave milk for sixteen persons, while butter claimed the larger sum of 7d. Together, this is only 9d. out of 5s. Of course this dinner is only one out of a hundred that might be given; indeed, it is not everyone who likes Vegetable Marrow, nor is it easy to believe it substantial. One may believe that the Potatoes and the

Peas, giving starch and nitrogen, bore the brunt of the battle on this occasion; but the fruit also (costing 19½d. with the sugar) gave no despicable aid. Apples are often as cheap as Potatoes, and it is said they might be much cheaper. Of all food, in most climates, fruit produces the maximum yield for a given area. In Ceylon it may be in Cocoa-nuts, in the plains of India from some other Palm, or from Bananas; in France, Chestnuts are the most productive crop; in England it may be Cobnuts, or it may be Apples; and the union of the two is as admirable in food as bread and cheese, or as Figs and Walnuts. Fruit, which our richer classes treat as a toy and eat for amusement, ought to be a main part of our national food; and the cheapness of sugar gives us a wonderful facility in turning to service whatever our often harsh climate does but imperfectly ripen. Wheat is often called the staff of life, yet it is astonishing how slow we are to learn its dietetic value. Indeed, because it is too nourishing, and quickly dulls the appetite, all its most nutritive part is carefully extracted by our clever confectioners, until it is made as light as possible, in the form, perhaps, of a French roll or a Sally Lunn. Our ancestors boiled it and ate it as "firmity" (frumenty). Now-a-days, this is turned into a sweet dish, which is eaten as a curiosity at certain times of the year. The confectioners boil the grains whole, which makes the husks disagreeable in the mouth. The Syrians managed this dish far better. It is the standard daily food with the mass of the people, and is called by the unmelodious name *berghal*. The Wheat is cracked, not ground, and then boiled—half an hour seems fully to suffice. They eat it with curds of milk, the oxygala of the modern Greeks; and no more tire of it, all the year through, than we tire of bread and butter at breakfast. This is one mark that some simple combination of food thoroughly satisfies Nature—that we do not hanker after a change. In this sense, one of the refutations of flesh food is, that we ill endure the same dinner every day. Wheat, treated as by the Syrians, is called by the American vegetarians Wheat mush, and it is best to adhere to this name. I find that after it is boiled, a little Onion, sliced fine and fried, then mixed in with butter or oil, and a pinch of savoury herbs, makes the mush highly palatable. Some persons indeed have mistaken it for minced mutton, when so dressed. There always remains something to bite, as the Wheat is not ground, but only cracked. Lentils are another very delicate and very nutritious article, which the English public scarcely uses. Peas and Beans are almost identical with it, only coarser. Barley, by the richness of its gluten, is far superior to Rice, and either dressed as a pudding with raisins, or as a soup, gives a very substantial meal. In short, no one can look into the subject and make a few trials without seeing the enormous resources at our side, which are now wasted through an exclusive zeal for butchers' meat—the food of comparative barbarism. We have but to hope that men will arise able and willing to advance and risk or contribute funds, in order that Vegetarian eating-houses may have a fair trial. The superior cheapness and fully equal niceness of their food, it may be reasonably hoped, would call back our artisans from the vain chase of flesh meat. Probably it would be found desirable to begin by the system called by us ordinaries; in France *table d'hôte*. Guests would not at first know how to order a dinner, and it is even better that they should not. To be able to produce at once whatever is required, is only the result of long experience, and by an incipient system could not be undertaken with more than a very few staple dishes; indeed, a higher charge ought to be made for every thing demanded at irregular hours or out of the routine. In a populous town, large numbers of clerks and artisans would be satisfied by the system of ordinaries, if the food itself satisfied them. Trial would soon ascertain whether breakfast would need any change. For those who like some warm cheap food at breakfast, and do not take kindly to oatmeal porridge (which ought to be always coarsely ground, little more than cracked, and never swallowed without biting), nothing is easier to prepare and more palatable than yesterday's Potatoes fried up with a little sliced Onion. The nitrogen in the Onion will in the long run please most persons, and to a really healthy stomach it brings no after-taste. So far the argument has proceeded, first on that side of the question to which a statesman will chiefly look; and we may complete it by observing that, however some economists may talk about our being over-peopled, it is certain that every English ministry in the future will be constantly exercised by the problem—how to keep our people at home and secure an increase of their numbers. More than ever is it manifest that in the long run the power of every European nation will rise or sink with the numbers of its population. Spain is on this ground left behind in the race. German statesmen are already alarmed at the drain from emigration. Russia increases her numbers steadily, and loses none to the New World. Russia and North America already alarm all Europe by the colossal magnitude which they are certain to attain. To equal them is impossible; but it appertains much to English security and dignity that these three

kingdoms should have a population of sixty millions rather than of thirty; and it is certain that under wiser diet and improved land tenure, we could as easily feed sixty millions from the soil itself, as we now feed thirty with the help of enormous importation. Secondly, and more concisely, we may turn to the physiological question—the healthfulness of a vegetarian diet. A popular topic here at once applies. Physicians agree that, except our poorest, the nation habitually eats too much, and that this is a very prevalent source of disease. The very common phenomenon of a heaviness which before the age of fifty, damages Englishmen's activity, seems to point at over-feeding. Now a flesh diet, by its smallness in bulk, directly tends to this evil. It does not fill the stomach, yet the stomach does not act well unless distended. For this reason innutritious food, whether hay, straw, chaff, shavings, even sawdust, is needed by cattle who are fed on grain; and all condensed food is unwholesome, even dangerous. By reason of the condensed nature of flesh meat, everyone who depends on it is tempted to take in more than his stomach can deal with; hence the doctor orders dinner pills to fortify us for a larger dose of flesh food. If they succeed, the patient retains health, but wastes on his vegetative functions the strength which otherwise would have been at his voluntary disposal. But if his system is not equal to the effort, the superfluous food loads him with unwholesome fat, clogs his vital organs, and wearies his muscles with his own weight. But beyond this the subject admits, and has received, a purely scientific treatment. Only the outlines can be here sketched. First, what are the diseases by which our richer classes are chiefly attacked? Those which stand in close relation to gout. Dr. Prout recounts them as "strumous, lithic-acid, and gouty diseases," and attributes them to an imperfect assimilation of the albuminous principles of food; that is to say, to an excess in flesh diet. Next, what classes of men recover best from wounds and severe accidents? Much important testimony affirms it is those who eat least of flesh meat. Eminent surgeons testify that in this respect the Indians and the Chinese far surpass the English soldiers, and attribute it to "their vegetable regimen." As gout is not heard of among Irish peasants, so too, it is alleged, their blood is less inflammable than that of well-fed Englishmen, and they recover better from severe hurts. Thirdly, it is claimed that vegetarians have more exemptions from the attacks of epidemic disease than flesh eaters; in particular it is denied that any case of cholera has been found among them. Fourthly, it is admitted by physiologists in general that the cases of extreme longevity are almost solely found among vegetarians. Of course many things must conspire that an individual may attain the greatest age possible to man. He must have had no hereditary weakness, no violent shock from accident or acute disease, no permanent excess of toil or distressing care, no long exposure to bad atmosphere in cities; and if vegetarian food is of critical importance, he must have been a vegetarian from childhood: then possibly he will live to the age of a hundred. It is ridiculous to expect that by adopting this practice late in life an individual can become signal in longevity; yet it is maintained he may somewhat lengthen his years, especially because the diet itself suffices to cure many maladies, probably by the greater purity which it gives to the blood. The case of Professor Adam Ferguson is signal and notorious. When past fifty he was seized with very alarming paralysis. His friend, Dr. Black, the celebrated discoverer of latent heat, who was no vegetarian, was called in to treat him, and prescribed a strict vegetarian and milk diet. Under this he entirely recovered; ate no meat and drank only water or weak tea for the rest of his life; had no second attack, and after the age of seventy was remarkably hearty, continuing in much vigour until almost ninety. He lived to ninety-three. The effect of a mere vegetarian diet to renew shattered life appears here undeniable. Fifthly, fruit, which is presumed to have been the food of original man—of man who is born "a tropical product," with hairless body—fruit is to him peculiarly medicine as well as food. The Germans have their "Grape cure," and among fruits let Grapes by all means have a most honourable mention; yet happily they do not stand alone. When a child was covered with ulcers from head to foot, and blinded by them—when physicians despaired and confessed drugs to be useless—Mr. S. Rowbotham, a surgeon of Stockport, guiltless of vegetarian theory, cured the patient perfectly in a few months by a diet of stewed English fruit and honey. Sixthly, to pass from these details of experience to the higher region of comparative anatomy and physiology, it is contended that the interior organs and teeth of man show him to have been made for a frugivorous animal. To this day even surgeons and physicians of eminence may be heard to say (what betrays an ignorance in them disgraceful), that our canine teeth show us to be made for tearing flesh. That this is a gross error is no new discovery. Linnæus, Gassendi, Ray, Cuvier, Thomas Bell, Lawrence, equally with Professor Richard Owen, avow our teeth not to be canine, but to be nearest to apes' teeth. Their

fangs are indeed larger than ours, and well adapted to crack strong nut-shells; but none of them in a state of Nature eat flesh. Indeed, anyone who examines a dog's teeth sees at once the entire contrast; yet our scientific men (so called) allow the epithet canine to run away with them! A close comparison of the digestive organs in man with those of the domestic animals on the one side, and of the carnivora on the other, shows distinctly that his organs are intermediate, as are those of the apes. The entire argument is very extensive. Mr. John Smith develops it in his "Fruits and Farnacea"; here it can only be pointed at. He admits that art and the use of fire make flesh tolerable to us as food, but denies that that which art enables us to do can ever thereby become normally necessary, or tend to so great robustness as the use of that food to which our physiology and anatomy direct us. The mediate place between herbivorous and carnivorous animals is denoted by the epithet frugivorous. This is the place of man; also of the apes and monkeys; apparently too of the bear and the pig. The horse also has some approximation to the human organs, perhaps because grain is a food so well suited to him. Seventhly, in detail certain peculiarities are alleged, to which a reader (if he concedes the facts to be all correct) will give what weight he thinks they deserve. It is said that no carnivorous animals sweat; and since man sweats this allies him more closely to the herbivora. It is further said, that in the carnivora the salivary glands are comparatively small, in the herbivora very large; and the reason too is plain: the herbivora masticate their food with their broad grinders, and need saliva for the operation; but the carnivora never grind food, they have no grinders, and they cannot masticate. Now, in all these points, man resembles the herbivora. The present writer, however, must confess that he is here at a loss concerning the facts. A subtle question often arises, What is natural to man? Is not art natural? Fire removes evil juices from Potatoes. Vegetarians will not renounce this use of fire. They steep Beans and Barley, they grind or crack grain, they boil, stew, and bake at pleasure. Mills and stewpots were not born with the first human pair: they are after-inventions of human art. So is the roasting of flesh. Why, then, may we not call this natural, just as baking bread is natural, because each is naturally developed during the growth of the human intellect? Of cookery, in the abstract, we must admit this. Cookery is requisite to make the greater portion of a flesh diet endurable to us; and without this a large part of the world could hardly have afforded food for man in his barbarism. In this intermediate state we may agree to call Homer's cookery of a bull "natural" to man. But, if we claim to appeal to evolution in defining what is man's nature—if we contend that that is our truest nature to which we tend in our nobler and advancing condition (a very just and wise view)—then we are carried to the conclusion that vegetarian food, being the inevitable future of every thickly peopled nation, is the practice that must be avowed as alone suited to our highest and noblest development. Man in tropical regions began from it. Driven into ruder climes, and unable to live on crops fresh sown, or on fruits not yet ripe, he was forced by harsh circumstances to feed on the animals who abounded on the wild soil, or on the fish of seas and rivers, and became himself wilder and harder hearted. The command of fire enabled him to overspread these new regions, and during an intermediate era he found it easiest to live by hunting and on tame cattle. Besides that, it was long difficult to protect crops; indeed, those who sow or plant must stay by their field till they gather the harvest. Inveterate custom fixes the diet of nations, and is deaf to argument, until stern necessity again comes in—as it assuredly must at last, if human population is to multiply. Thus, as evolution proceeds, it is discovered that flesh-eaters are struggling against a deep current of Nature, and must suffer, if they are obstinate, in the contest.

The Professor finishes his paper by discussing the vast amount of cruelty and suffering to animals incident to the present great use of butchers' meat.

Sunken Boilers Unnecessary.—No boiler need be lower than the return pipe, and the flow may be at the same level if required. Fix the boiler level with the return pipe; let the flow rise perpendicularly a few feet, say 5 or 6; then with a syphon bend bring it down to the same level as the return; it may then be carried to any distance without the least fear of the water not circulating quickly. I have a low greenhouse 140 feet long heated in this way with a No. 3 Tubular Boiler. The water circulates rapidly, and nothing could answer better, clearly showing that sunken boilers are unnecessary. A good sized air pipe should be inserted into the syphon.—W. WILLIAMS, Ryde.

Boiler Setting.—Referring to this question, I believe the advantages of having the boiler under its work have been over-rated. Judging from my own experience, it is not indispensable either for efficient or economical working. About four years ago, being unable to drain the stoke-hole, we lifted our largest boiler, so that its crown or top is now 18 inches above the main flow in the houses. I cannot see the slightest difference in its working, and the consumption of fuel is certainly not greater. I could point out other instances where the boiler is still higher, but the results are the same. In all cases where the boiler is thus raised, a 3-inch expansion pipe should be placed at the highest point and carried up vertically 8 or 9 feet.—E. HODDAR.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Potato Planting under Slight Protection.—Few crops are of more importance than the Potato crop, and means should therefore be taken to obtain it out-of-doors as early as possible; for, although Potatoes grown in pits and frames are very acceptable, still, unless brought on in such places very slowly, they are rarely equal in quality to those grown in the open air. If there exists a good south wall, this will, no doubt, be occupied with fruit trees; but, without in any way interfering with these, a row of Potatoes may be grown at the foot of the wall that will come in, with a little care, a fortnight earlier than they can be grown without protection, even in a sheltered border at a greater distance from the wall. Fork the ground over 15 inches wide from the wall, not going so deep as to injure the roots of the trees; and, if the soil be poor, add a little rotten manure; then open a trench 8 inches from the wall and about 4 inches deep, drawing the soil forward; take some of the Potatoes that a short time back were advised to be prepared by sprouting, reduce the sprouts on each tuber to two, and in planting cover them with the soil very carefully so as not to injure them; 9 inches will be far enough apart, as they will be taken up as soon as large enough for use. Where there does not exist a wall that can be taken advantage of in this way, a few square yards of a warm sunny border should be selected; this should have the assistance of a temporary frame made of light boards, with strips of wood nailed across, so as to admit of being covered at night with mats, when the crop appears above ground, which it will before spring frosts are over. Crops thus produced will be found to be well worth the labour bestowed on them, as Potatoes raised in this way will come in after those that have been grown in frames are used, and before those in the open ground that have received no protection. Potatoes and Radishes in frames will now be up, and must receive plenty of air on all occasions when it is not absolutely frosty, or they will become drawn. The lights should be raised at both ends for these crops, so as to let the plants have air equally all over.

Cucumbers.—Where a bed was made up for these in the beginning of the month, and the seed sown as soon as the bed was fit to receive it, the plants will now be coming up, and will require care during the cold winds of the ensuing month; keep them within a few inches of the glass, and place on both sides of the bed two feet in width of good hot dung, allowing it to come up the sides of the frame to within 6 inches of the top. Put a foot of litter at both the top and bottom. The side linings will impart fresh heat to the bed, and the litter will assist in keeping out the cold winds. The plants should receive a little air by raising the lights at the back half-an-inch or so every mild day. They will require slight shade when the sun is very bright. The principal bed to fruit them in should now be prepared, making it in every way (but larger) as directed for the bed in which the seedling plants were raised. Where advantage of a stove can be taken, the plants advised to be sown in January will now be in a fit condition for planting out. Three or four plants grown in boxes 2 feet by 3 feet, and 18 inches deep will, if well managed, produce through the season a very large quantity of Cucumbers. The best way to proceed will be to place two plants in each box, allowing one in each to bear a few fruit earlier than would be advisable for plants that were ultimately to bear on through the season; and when these earliest fruited plants have borne a few to cut them out; their space to be occupied by the others which were not allowed to fruit so soon.

Pruning Roses.—The time has now arrived when Roses will require attention as regards pruning. There is a considerable difference in the time when this necessary operation is performed by growers; the exhibitor of Roses prunes his plants at different times, so as to enable him to have a chance of the best blooms at the particular times at which he wishes to show them, for, upon early or late pruning, provided there is no mishap through spring frosts, will depend the time, in some measure, of flowering—thus, the earlier Roses are pruned the earlier they will bloom if not cut off by frost. But, for those who grow Roses, either to admire them on the plants, or with a view to being able to cut them in quantity, the principal consideration will obviously be to prune at the time that is most likely to ensure a plentiful harvest of flowers, independent, as far as possible, of spring frosts. Some allowance should be made between the south and north of the kingdom, as also between the localities that are dry and early, and others that are damp, low, and subject to late spring frosts; if not pruned until very late, say April, the growth, which will have then made considerable progress at the extremity of the shoots, is so much of the energies of the plants wasted. The best time for pruning in general may be set down as the first days in March for the more favoured parts of the country, with the middle of the month for such as labour under local disadvantages of climate. I have known some amateurs so impatient to

have their Roses pruned early, so as to present a trim appearance, that they could not bear to see them left longer than the end of January; the result was, that year after year, the first, and by far the best flowers, were all cut off; yet, it never seemed to occur to them that it was the early pruning that was the cause. As to the extent to which Roses should be pruned, that is altogether dependent upon the strength of the variety; a plant of a given size of any strong-growing kind will most likely be able to make a dozen and a half of strong vigorous shoots, each bearing a goodly bunch of flowers, whereas a plant of a similar age, but a weak grower, will not, perhaps, be able to make four or half a dozen shoots strong enough to bloom; consequently the strong-growing sort will require pruning so as to allow it to form a score or so of shoots, whilst three or four will be enough for the weakly grower. This, I am aware, is opposed to the old theory of Rose pruning, but it is not opposed to a common-sense view of the matter. But I would say to the amateur, Do not grow these delicate, and, for your purpose, worthless weak Roses; and if you select the varieties you grow from the exhibition stage, you are sure to have a good sprinkling of these weak sorts. The object of the amateur is to get a quantity of beautiful flowers, and not to grow half a dozen plants of one kind, however excellent the individual blooms may be, even if from the half-dozen plants he only obtains as many flowers in a season. Thus it will be seen that the extent of pruning to which each tree or bush is subjected must be regulated by the natural strength of growth of the variety; the shoots that are allowed to remain may be cut back to three or four eyes, and all others cut clean out from the base where they spring, not in their case leaving so much as a single eye, as the object is to direct all the energy of the trees into the flowering shoots.

Glass Structures.—In the stove the generality of plants may now be potted; such as *Eucharis amazonica*, *Francisceas*, *Gardenias*, *Aphelandras*, *Ardiasias*, *Cyrtanthera magnifica*, *Eranthemums*, *Vincas*, *Torencias*, *Ixoras*, *Plumbago rosea*, *Pentas carnea*, the white-bracted *Mussaenda frondosa*, *Begonias*, *Alocasias*, *Caladiums*, *Anthuriums*, *Crotons*, *Dracenas*, *Marantas*, *Aralias*, &c., giving them pots proportionate in size to the requirements of the individual plants or the size it may in each case be advisable to grow them to. A good-sized stove plant of most kinds may be grown in a moderate-sized pot, especially if assisted through its most active growth with manure-water. Where there exist Vines in bearing condition that were pruned, and that received their winter dressing at the time advised, these should now be encouraged to push, by keeping the house close, with little air admitted; but this must not be attempted yet for some weeks, if it is simply a cold Vinery, without any heating apparatus, as in that case there might be danger to the young shoots, when just "broken," from the severe frosts we frequently get at the end of April.

A VINE AND PEACH TREE DESTROYER.

(OTIORHYNCHUS SULCATUS.)

AMONGST the numerous insects which annoy and trouble the cultivator, there is perhaps none so injurious and difficult to combat as this. Though classed with beetles, I believe the hard wing cases of these weevils are joined together, and do not cover true wings; at least I have failed to find any, and believe they never fly. But I am more acquainted with their habits than with their anatomy. Nothing is to me more surprising than that an insect which travels so slowly, and appears unable to fly, can find its way with such unerring instinct to the plants upon which it feeds. Perhaps the solution is that they are very numerous, and will feed on a great variety of plants. Of one thing I am quite sure, that many cultivators attribute the mischief caused by the grub of this weevil to the wire worm. The wire worm is injurious enough to Carnations, Pinks, Daisies, many of the Grasses, Carrots, Potatoes, and perhaps other culinary vegetables; but I never in my life saw the root of any tree or shrub touched by them, and should not care if there were a hundred thousand in my Vine border, provided they did not leave it for any other pasture. The grub of the *Otiorynchus*, which is white, and shorter and fatter than the wire worms (which are yellow, and, as their name implies, tougher), is a much more general feeder. There is little doubt they feed on the roots of Grasses, because I detect them at times in turf soils just brought from the field. They will be found at the roots of Yew trees, the small fibres of which are a very favourite food with them; and where Yews abound these insects are generally plentiful, but, as old Yew trees make such an immense mass of roots, they seldom or never appear to suffer from their attacks. But amongst a lot of seedling Yews the effect is very different, for fond as these pests are of Yew roots, they much prefer the young stem of a seedling Yew just below the surface of the ground; and, as they remove all the bark down to the hard wood, of course the plant is killed. In the same way they attack young *Rhododendrons* and *Azaleas*, and

many nurserymen have lost thousands of young plants from this cause, whilst the injury to older and established plants is generally trifling, as they never eat the stem of an old plant, though in light peaty soils they are sometimes numerous enough to injure even large plants by eating the roots. In the same way young Vines are often destroyed whilst in small pots, though I never knew an established plant suffer from their attacks. They are also very destructive to young *Camellias*, many plants being lost by the injury of the bark just under the soil; but as these plants do not at once show the effect of the damage, the cause is often not detected. Before the leaves of a *Camellia* change colour, the stem has had time to turn brown, and it is not easy to see the bark has been removed below the soil without careful scrutiny. It will be seen from these remarks that nurserymen are greater sufferers from the depredations of these insects than any other class of cultivators, because young and tender plants are what they chiefly affect. I know no instance in which they attack the stems of old plants, though I have known the roots of Peach trees injured. So little are the habits of insects studied by those most interested, that I have known men who have suffered severely who had never recognised their enemies; others who have known to their cost the grubs or larvae, and called them ringers, from their habit of ringing or removing the bark from the stems of plants, yet had no idea what insect they turned to when in the perfect state. The grubs of the Click Beetle, known as wire-worms, remain in the larva state three years, which accounts for the great injury sustained by many who cultivate fresh broken-up turf soil for two or three seasons, but the *Otiorynchus* grub turns into a beetle the following season as soon as warm weather comes. A little before it changes, the grub, which was white, with a head of a slight yellowish colour, has almost a black head. The beetle is of a dark colour, almost black, with the wing cases corrugated or furrowed. It is a night feeder, and is generally at rest and hidden during the day. It feeds on the leaves of the Peach, Vine, Fig, *Camellia*, Orange, *Rhododendron*, and many other trees; and where such leaves are seen to be eaten on the edges they should be examined by candle-light, and the beetles destroyed. Care must be taken not to shake the trees, as the insects will fall to the ground, and remain so entirely without motion as to be very difficult to find, unless a sheet be spread on the ground to catch them. There is one kind of mischief these insects effect I had forgotten to mention, and yet it is often very serious to young trees. Thorns, Purple Beech, standard Briars, &c., when fresh planted, will, if the spring be very dry and warm often die in large numbers, and yet many of them, if unmolested, would probably have lived. If they are carefully examined, it will be found that the buds have been eaten out, or eaten round, at the base of the bud. On examining such trees at night, this and a smaller brown weevil will be found at work in large numbers. It appears that plants in ill health, or struggling for life, are like unhealthy animals, a favourite food for insect pests. I have now given you an account of all I know of this insect plague, and if others of your numerous readers can add to the information I shall be much obliged to them for any additional facts, particularly if anything is known of the rate of increase. The number of grubs found in hot-houses, where few or no beetles have been previously seen, would lead one to believe they must lay a great number of eggs, but I have never detected where or how they are deposited. One fact of interest I had forgotten—the toad appears one of its greatest enemies, and devours them whenever the opportunity is afforded it.

Chilwell.

HOME-GROWN TOBACCO FOR PURPOSES OF FUMIGATION.

I WAS surprised to see (p. 168) the merits of home-grown Tobacco for fumigating purposes so much underrated as to be compared with "common brown paper." I do not know what it may be like in the north, but in the west and east of England I have grown it, and seen it grown, for fumigating purposes for many years, and always found it far superior to ordinary tobacco-paper if properly attended to and harvested. Your correspondent must, I think, have grown one of the thick, sappy-leaved varieties instead of that best suited to the purpose in question, and, if so, his failure may be accounted for. The variety I grow, and would recommend for the purpose, is *Nicotiana virginica*. This, when well grown, has leaves from 2 feet to 2 feet 6 inches long, and 6 to 9 inches wide. All the other varieties I have seen have rounder leaves with large, raised, succulent-looking veins. They are more difficult to dry than *virginica*, and, when dried, are much less pungent and useful for fumigating. I do not suppose that Tobacco grown in this climate contains anything like the amount of essential oil to be found in the leaves of plants grown in more southern latitudes; but, that they contain sufficient to be more destructive to greenfly and thrips, weight for weight, than tobacco-paper, I have

J. R. P.

proved over and over again. The great thing is to grow the plant well, so as to get all the leaves to their full size and properly matured before harvesting them. To do this, there should only be eight or nine of the main leaves allowed to remain on a stalk, as the lateral leaves and those towards the top have not time to come to perfection, and are thin, sappy, and useless. As soon, therefore, as the plant has formed that number of leaves, it should be stopped, and any growth that may show afterwards at the axils of their leaves should be removed, so as to throw the whole energy and strength of the plant into those remaining. The plants should not be allowed to flower to a greater extent than is necessary for the purpose of bearing seed, should it be required for supplying plants for the following year. The seeds should be sown in heat towards the end of April, and as soon as the plants are large enough to handle they should either be pricked out, or potted singly in small pots, in light rich soil, to be nursed on in gentle heat till the end of May. They should then be gradually hardened off for planting out early in June. An open sunny situation should be chosen for growing them, and the ground should be properly prepared by trenching or deep digging, working in, at the same time, a good dressing of rotten manure. The plants should be planted in rows 1 yard apart, and 2 feet from each other; and as they progress in growth they should be staked singly, or, if stakes are scarce, they may be placed at wide intervals, with a strong one at each end of the row to which to strain a piece of stout string or tar yarn, and to this the plants may be tied. While growing, they will be greatly benefited by receiving a good soaking or two of manure-water, and care should be taken that they do not receive a check at any time, or the leaves will not attain a large size. When of full size, and properly matured, they should be gathered and hung on nails in a dry open airy shed, or threaded on string and hung in the same situation. If placed in the sun or dried too quickly, the leaves crumble to pieces, and the Tobacco loses a good deal of its strength. As soon as they are properly dry, they should be packed away in boxes, and stored in a dry place to keep them from getting mouldy. During the process of packing, some very fine powdered saltpetre may be shaken in amongst the leaves, in the proportion of 1 oz. to 20 lb. of leaves. This will make them smoulder away in the fumigating pot, and add to their effect in destroying insects. In smoking, make choice of a still damp night for the operation, as the laps of the glass are then filled with water, and the house is comparatively air-tight. Repeat the operation early the following morning while the insects are weak, and before they have time to recover through the admission of air to the houses, as this has a revivifying effect on them. Syringe immediately after to wash off stragglers and refresh the plants.

J. SHEPPARD.

Grafting Cabbages.—A correspondent of the "Gardeners' Record" states he has grafted Cabbages successfully. For this purpose I made choice, he says, of two varieties of the Cabbage—Enfield Market as the stock, and the Red Dutch as the graft, choosing the darkest plant that my seed bed then afforded. The grafting was performed at the end of April, 1872; they united very freely, and the scion grew very luxuriantly. It is well known that, under ordinary circumstances, each of these Cabbages produces very close, firm heads, but in this case the graft showed no inclination to do so; it remained open, with a slightly apparent dash of stock blood. At the end of spring, 1873, it threw up a very strong, straggling, flowering stem, from 7 feet to 8 feet in height, the individual flowers being particularly large, but by no means abundant; consequently the quantity of seed ripened was not large. During the first week of February, 1874, a portion of the seed was sown, the result of which is that I have obtained a somewhat interesting lot of Cabbages, Kale plants (very dark and curled, nearly, if not altogether, as dark as such as Dell's and Belvoir Castle Beet), Savoys, and Red Cabbage, a considerable number partaking of the character of the stock family. Although imbued with the blood of the graft, that of the stock predominates in the majority of cases, and, strange to say, all the progeny appear to be more or less deficient of the tendency to Cabbage.

PERSONAL.

MR. JOHN SHERRATT is about to remove to his new Knypersley Nursery, in which he has built several Orchid and other houses, and ventilated them on Richardson's system.—Mr. Farr, late of Owlpen Park, Gloucestershire, is about to take the management of Sir Rainald Knightley's gardens at Fawsley, near Daventry; and Mr. Shepherd, formerly of Lytham Hall, Lancashire, succeeds Mr. Wicks in the management of the gardens of Mrs. Kemble, Vellore, near Bath.—Mr. Lascelles, of Bunhill Row, Finsbury, is just completing an order from the London School Board for 11,000 pitch-pine desks and seats for their new schools. Mr. Holloway has also given him instructions to prepare the wood-work for his Sanatorium, which is to be completed in six months, at a cost of £10,000.

NOTES AND QUESTIONS—VARIOUS.

[Many notes and answers, obligingly sent us by correspondents, are unavoidably omitted this week from want of room.]

Flowering Time of the Snowflake (*Leucojum vernum*).—Mr. Niven, in his notice of this interesting flower, says that it flowers a month later than the Snowdrop, i.e., about the middle of March. Here, in the south-west of Scotland, it opened its first blossom on the 13th of February—this year in a north border. Snowdrops were very late this year, and were then, and continue to be, in great beauty.—SALMONCERS.

Burnell's Alexandra White Cos Lettuce.—This (see p. 154) is misnamed Williams's Alexandra White Cos. I can corroborate Mr. Burnell's statement that it is the best of Cos Lettuces for summer use.—R. BAXBOW, *Wimbledon*.

The New Conical-fruited Solanum.—This has been named, we observe, by Messrs E. G. Henderson, *Solanum hybridum Hendersoni*. So very productive is it that upon one plant alone, scarcely 18 inches in height, as many as 200 fruits were counted.

Aloes now in Flower at Sudbury House, Hammersmith.—*A. ciliaris*, *A. Salm Dyckiana*, *A. fruticosa*, *A. humilis*, *A. variegata*, *A. Cooperii*, and *A. plicatilis*. We have also a fine *Agave*, not before seen in flower, starting; it has grown 4 feet in one month. *A. squidenis* also shows signs of flowering, as does likewise *A. Bessereriana hystrix*.—J. CROUCHER.

Coronilla glauca and Heliotropes as Winter-flowering Plants.—In a lean-to greenhouse, heated by a flow and return pipe, I have a *Coronilla glauca* trained to the back wall, and I know of nothing more beautiful than it is, or more useful for cut flowers. It has been in bloom since November, and is still full of flowers. The *Heliotrope*, too, is equally useful.—A. MACFARLANE, *Great Tew, Easton*.

Prizes for New Peas.—Mr. Laxton, of Stamford, offers thirty guineas in prizes for Peas grown from seeds of kinds raised by him. The highest prize is £4, there are two of £3, two of £2, twelve of £1, and ten of 10s. each. The competition is to take place at the Midland Counties Grand Horticultural show at Birmingham, on the 1st, 2nd, 3rd, and 5th July, and on the occasion of the Royal Horticultural Society's Rose show at South Kensington, on the 7th of the same month.

Compton's Surprise Potato.—This is a coarse-looking purple-skinned Potato, with somewhat sunken eyes; it is flattish, long in shape, but has firm white flesh. It keeps well, and makes a capital Potato for the spring months, when the earlier sorts are exhausted. As it is a robust grower, and will produce tubers of great size, it should be grown in rather poor soil, where it will always yield a large crop. It resembles the old Jersey Blue, but is a heavier cropper.—A. D.

Major Clarke's Solid Red Celery.—I have long grown the Sulham Prize, Sandringham, and several other kinds of Celery, red and white, and I am of opinion that Major Clarke's is undoubtedly the best of the red varieties. In flavour it is unsurpassed, and it is remarkably firm, solid, and brittle; even the outer leaves are thicker in proportion to the length than those of most other kinds. It is very hardy, and it is very rare to meet with a soft or pithy plant of it. In short, it is altogether a first-rate Celery.—J. E.

Drying off Bulbs.—Allow me to bear testimony to the soundness of "J. S. W.'s" advice with regard to keeping *Caladiums* moderately moist during winter. The same advice is equally applicable to watering *Gloxinias*, &c., which, if dried off suddenly and kept in a high temperature, are likely to disappear entirely. Not only do stove bulbous plants suffer from being dried off, but even hardy and half-hardy ones as well. Those who force many *Hyacinths* might reduce expenses next autumn by attention in this respect.—R. P. B.

Hardy Autumn Flowering Plants.—I have two long borders planted with standard Roses, Japan Lilies, *Gladioli*, *Phloxes*, *Antirrhinums*, and *Pentstemons*. What else can I add to bloom in autumn?—W. T. C. [*Anemone japonica*, and its varieties, *Asters*, *Chrysanthemums*, *Larkspurs*, *Fuchsias gracilis*, *Gaura Lindheimeri*, *Helianthus multiflorus*, fl.-pl., *Lupins*, *Knoshera Lamarckiana*, *Platycodon autumnale*, *Schizostylis coccinea*, *Tritoma Uvaria*, *Veronica Andersoni*, autumn *Crocuses*, *Colchicums*, *Sternbergia lutea*, and many others. See page 233 of "Hardy Flowers," where a long list of the best hardy autumnal flowers is given.]

Centradenia rosea.—The old *Centradenia rosea* is a very charming little plant of pendulous growth, with light rose coloured flowers, and might be used more than it is for general decoration. Owing to the smallness of its leaves, it grows into a dense wavy voluminous mass—a habit much needed in giving effect to other plants. This little Mexican *Melastomad* is easily grown and increased by means of cuttings in spring, which strike freely, and by potting on in summer and growing them in a temperate place with plenty of moisture, they thrive and make beautiful plants by autumn. They are not particular as to soil—provided it be free and open. They will thrive in almost any mixture, but I prefer two parts loam and one of river sand, and small pots.—CHEVALIER.

Large Scotch Firs.—The remarks recently made in your columns respecting these trees lead me to again mention a remarkably fine specimen of the Scotch Fir that stands in one corner of the estate of the Right Hon. Wm. Cowper-Temple, at Nursling, near Romsey, Hants. I much doubt whether there is a finer or, indeed, a handsomer tree of its kind anywhere in the south of England. It is some eight years since I last saw it, but then, when attempted to be enclosed within the arms of two tall full-grown men, chest high, there was still about 18 inches to be encompassed. This would make its girth at 5 feet from the ground to have then been 13½ feet; probably by this time it is 14 feet in circumference. The stem, to a height of about 30 feet, is remarkably clean and smooth, and it has a fine rounded healthy head.—A. D.

The Orange-milk (or Red-milk) Agaric (*Lactarius deliciosus*).—Can you give me any information respecting the red-tinted Fungus found in Pine forests, and which is said to be superior in flavour to even the common Mushroom, as its specific *deliciosus* would indicate. A neighbour of mine, who has several Fir plantations, would be glad to know what steps he ought to take to introduce this Fungus into them.—CHARLES BOYS. [This Agaric is by no means uncommon. It grows under the drip of Scotch Fir trees, and may almost always be found at the proper season where these trees abound—that is in September and October. There is no fear of mistaking this Fungus with ordinary care. Its cap is of a dull rufous orange colour, turning pale when growing in situations exposed to light, with narrow concentric circles or zones of a deeper hue. It is the only Agaric which yields an orange-red milk when cut or broken, and which turns a dull green an hour or two after being bruised. When you have found it we will tell you how to cook it; you will be sure to find it in the line of drip from Scotch Fir trees growing in open Grassy situations. There are many other red-tinted Funguses growing under Fir trees, but this only is safely to be recognised by ordinary observers. Try the effect of introducing the mycelium or spawn into your neighbour's plantation.]

No. 178.]

SATURDAY, MARCH 6, 1875.

[Vol. VII.]

"This is an art
Which does mend nature: change it rather; but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE GIANT LILY NEAR LONDON.

IN compliance with your request, I forward the following note in reference to this Lily. The soil of my garden, like that of the rise of East Sheen continued into Richmond Park, is a gravel of a good binding sort, excellent for the walks. It rests upon "London clay." The depth of the gravel with me is from 10 feet to 16 feet, and affords good drainage to the beds; but, for any special growth, loam and bog-earth must be added. The gravel was removed, in 1860, to a depth of 8 or 10 feet, and many loads of bog-earth, with some loam and a little lime, were put in to receive the Rhododendrons and Azaleas in the round "Rhododendron bed" on the lawn. In May, 1872, I planted three bulbs of *Lilium giganteum* in three of the interspaces of the Rhododendron bushes, which spaces had the best aspect in regard to sunshine. Silver sand, as usual, was put about each bulb, set at the depth of 6 inches, in the above soil, with the addition of old leaf mould, which had been rotted with occasional drenchings of dilute liquid manure. There was a feeble sign of growth in the autumn of 1872, and the bulbs were protected through the winter of 1872 and 1873 by a light covering of dried Fern. In May, 1873, three of the leaves began to rise, and diverge from each bulb. They were carefully protected from occasional frosts, but no flower-stem was developed this summer. After similar winter and spring treatment (as against frosty nights in May), a grander spread of the fine broad, bright, glossy, leaves appeared; and, in June, 1874, I occasionally gave the Lilies dilute liquid manure. From one only of the three did the magnificent columnar flower-stem, 2 inches thick, spring up to the height of 6½ feet, which became crowned with nine flower-buds, the first of which opened on the 2nd of July, lasting to the 9th, and the others in succession, with a like period of bloom. A broad band of violet contrasted with the enamelled whiteness of each gracefully recurved petal; and as one sauntered over the lawn in the vicinity of the large clustered flowers, their delicate perfume, diffused through the summer air, added to the pleasure. They formed seed-pods, 3 inches long by 1½ inch diameter. Whether the seeds, ripened in the open air and gathered in October, will sprout, the experience of the coming months will decide. In the event of this attempt to fulfil your wish meeting the eye of the "Correspondent at Ipswich," who, after the notice in *THE GARDEN* last year, wrote to me on the subject, I regret to say that his letter became mislaid;

and, if he will again favour me with his name and address, his wish will be attended to. I am in hopes that the two bulbs, which developed only leaves last summer, may give us flowers in the ensuing one, and shall be grateful for any hint from more experienced floriculturists.
RICHARD OWEN.

TREES IN WINTER.

I HAVE often thought that this subject, to which Mr. McNab refers (see p. 147), ought to receive more attention from landscape

gardeners, and planters generally, than it does at present. The individuality of different ornamental trees is much more apparent in winter than in summer. When clothed with foliage, we lose all the character and variety noticeable in the arrangement of their branches and twigs, which is very distinct in different species. One of the most obvious features in connection with the wintry aspect of trees is their tone or colour. The common Elm, for example, stands out nearly black when seen against a clear grey sky, or when snow is lying on the ground; and the same may be said of the common Hawthorn. Oaks are a little more cheerful in tone, and Poplars still more so, as their growth is more pliant. A Poplar, when swayed to and fro on a bright winter's day is one of the most beautiful of all trees, because then the different shades of soft silvery-grey and brown are reflected from the branches in a very pleasing manner. Poplars are always in motion, too, whenever there is the slightest breeze, and this gives variety and interest to the groups of other trees in which they are planted. They are very attractive when budding out in the spring, which some of them do very early; and their green shades, being very delicate, harmonise thoroughly with the soft browns of the stem and branches. One of the lightest and brightest of all trees in the winter, however, is, undoubtedly the common Birch, which should always find a place on the lawn, and especially in the vicinity of ornamental water. Seen on a bright sunny day in December, the Silvery Birch is one of the most beautiful of all ornamental trees, and when covered with white hoar-frost, it is difficult to imagine a more attractive object. The Wych Elm and Larch are also beautiful under the circumstances just named. The Larch, when planted as an isolated specimen on the lawn, is most effective, and very different from the same tree when drawn up in a mixed plantation. As a solitary specimen it varies in height from 50 to 100 feet; and its light drooping branches feather down to the turf in the most graceful manner; no ornamental tree is more beautiful in the early spring months, when its young foliage shows the most fresh and delicate shade of green imaginable. The common Ash is a bright-looking tree in winter, the bark being of a silvery-



The Giant Lily (*Lilium giganteum*).

grey, or light brown tint. This tree ought to be more generally planted in the suburbs than it is; for, as a town tree, it is immeasurably superior to either Elm, Lime, or Chestnut, all of which suffer from drought and red-spider during hot summers, and lose their leaves or become rusty towards the end of July. The Ash is rather late in leafing, but, like the Planes, its foliage keeps fresh and green, until the sharp frosts of autumn cause it to fall; and, on this account, it deserves a place in town squares and gardens. B.

NOTES OF THE WEEK.

— BULBS of *Narcissus monophyllus*, received from Algeria by post, have just flowered in the Rev. M. J. Berkeley's garden, at Sibbertoft. This Daffodil has previously flowered at Kew, and appears to be a somewhat variable plant. Mr. Berkeley states, that the flowers produced at Sibbertoft are much smaller, and of a purer white than those of the Kew specimens, and we have ourselves observed the same peculiarity in the flowers of this variety produced by bulbs received from Algeria by Mr. Giles Munby.

— THE rare and distinct *Miltonia caneata* is now flowering freely in Mr. Peacock's collection at Hammersmith. In habit it resembles *M. Clowesii*, and bears from four to six flowers on a scape. Its greenish sepals and petals are crisped or undulated, and conspicuously blotched with blackish-brown. The wedge-shaped lip, which is about an inch across, is of snowy whiteness, and contrasts strikingly with the other divisions of the flower.

— AN evidently careful observer, writing in the "Botaniska Notiser," shows good reason to doubt recent statements that leaves of *Drosera* eat flesh. "That the meat mostly disappears when it becomes rotten is not very surprising; the *Bacteria* consume it; but that the leaf has absorbed it through the cells of the glands, whose contents are contracted and dead, must be considered to be out of the question."

— THE south side of Covent Garden Market has now been roofed with glass, which not only protects the stalls and their produce from the ill effects of exposure, but has improved the appearance of that side of the market. The new roof is about 220 feet long by 60 feet wide, and has an extreme height from the market level of 60 feet. It is curvilinear, the span being carried on iron ribs, springing from columns on each side. The upright sides of a lantern, which runs the whole length of the roof, has been left open for ventilation, for which ample means have also been provided elsewhere; and the whole structure has a light and cheerful aspect. Let us hope that other parts of the market still unprotected may receive similar attention.

— IT may interest lovers of curious plants to know that Mr. Elwes has now in flower the following species of Terrestrial Orchids, viz., *Ophrys fusca*, *O. Speculum*, *O. tricolor*, *O. Scolopax*, and *O. aranifera* var. *specularia*. *Speculum* and *tricolor* are among the most beautiful of all the European sorts, while the variety of *aranifera*, called *specularia*, is a large and handsome species, and very variable. *Neotinea intacta*, the plant lately discovered in Ireland, is also in bloom; it is curious, but not showy. These were all in a cold frame during the summer and autumn, and were moved into a greenhouse just before Christmas. Many other species are showing their flower-spikes, and will be in bloom as soon as the sun, which has hardly made its appearance this year, comes out again.

— MR. WM. FALCONER, writing to us from Rosedale Nurseries, Brenham, Texas, says, "horticulture is very backward here; true, I saw one little greenhouse at Galveston and another at Houston, and a few Oranges, Oleanders, and such things, in the gardens; but, in country places, poultry and pigs reign supreme where Daffodils and other flowers ought to grow. With respect to vegetables, the people seem peculiarly negligent, and can in no way be compared, as regards industry in this direction, with the New Englanders. Just now, all we possess in the way of culinary produce are Sweet Potatoes and Shallots, whereas 'up north' they have Potatoes, Cabbages, Squashes, Turnips, Carrots, and other roots in the cellars, besides quantities of Tomatoes, berries of many kinds, Pears, and barrels upon barrels of Apples. Here very inferior Apples cost from 10 to 20 cents a-piece."

— THE March number of the "Botanical Magazine" contains coloured plates of the following plants:—*Gustavia gracillima*, a very showy Myrtaceous shrub, collected by Roezl in New Granada, and sent by him to Mr. W. Bull. Its lanceolate serrate deep green leaves are a foot or more in length, whilst its great single Rose-like flowers are 5 inches in diameter, and have a thick green purple-rayed disc in the centre. *Masdevallia Chimæra*, a singular Orchid, having spatulate fleshy foliage, and yellow-crimson spotted hairy flowers. Its sepaline tails are 3 or 4 inches in length, and of a clear reddish-crimson, or blood, colour. *Colchicum luteum*; this is the only yellow *Colchicum* at present known. It comes from the mountainous ranges to the west of India, where it grows at 6,000 or 7,000 feet elevation. The flowers are little more than an inch across, but the colour is bright and effective. *Theropogon pallidus*, a pretty little grassy-leaved Liliaceous plant, with many-flowered scapes, which, at first sight, remind one of pink-flowered scapes of Lily of the Valley. It is nearly related to *Ophiopogon*, but is readily distinguishable by having deciduous foliage. *Wahlenbergia tuberosa*, a pretty little bell-flower, with a tuberous root stock, and slender stems of white pink-striped

flowers. It is a native of Juan Fernandez, whence Messrs. Veitch and Sons received it from their collector, Mr. Downton.

— A NEW edition, with many additional illustrations, of "Alpine Flowers for English gardens" is in preparation and will be ready in the spring.

— THE rare and beautiful *Phalænopsis intermedia* is now in flower in Mr. Bull's collection at Chelsea. Its sepals and petals are white, shaded with lilac, and the lip is of a rich lilac-purple colour. It is a native of Manilla.

— THE collections of *Camellias*, *Phalænopsis*, and *Nepenthes*, in the Royal Exotic Nursery at Chelsea, are now in excellent condition and well worth a visit. The *Camellias* and *Phalænopsis* especially are flowering in the greatest profusion, and are in the best possible health and vigour.

— M. CARRIERE, writing in the "Revue Horticole," gives a remarkable instance of the vitality of a *Chionanthus* bud which, nearly sixteen years ago, was inserted in the Flowering Ash (*Fraxinus Ornus*), and which has sent out a vigorous shoot that is growing rapidly and strongly. An illustration of it is given in the "Revue."

— AS an example of the enormous scale upon which the cultivation of fruit trees is carried on in the United States, it may be mentioned that a recent State return shows that, in 1873, 334,067 acres in Illinois alone were occupied by orchards; while according to a Blue Book return, published a short time since, the orchards of Great Britain only covered 150,526 acres, being less than half the return for one American state.

— WE have received fresh blooms of *Oncidium* (*Odontoglossum*) *platyodon*, now flowering for the first time in this country—so far as we are aware—from Sir William Marriott's collection at Down House, Blandford. The plant is of robust habit, and the flowers which measure about an inch across, are of a clear yellow colour, and quite distinct from those of any other species with which we are acquainted.

— FROM the superintendent's report (1874), it appears that the Royal Botanic Gardens, Calcutta, are recovering very slowly from the devastating effects of the cyclones of 1864 and 1867. The growth of the shrubs and trees planted to replace those uprooted has not been very luxuriant, and a long time must elapse before the welcome and useful shade of noble trees, such as once filled the garden, will be enjoyed there again.

— THE South Park Commissioners of Chicago have recently determined upon the establishment of botanical gardens in the park, and have set apart for the purpose a tract of 60 acres, to which additions will be made from time to time, as occasion may require. A botanical museum and herbarium will be included in the scheme. A circular has been issued by the board of managers, soliciting contributions from kindred institutions. The works are to be commenced as soon as the weather will permit.

— AN International Horticultural Exhibition will be opened at Cologne on the 25th of August next, under the patronage of the German Empress and the Crown Prince. The general committee has issued a circular, inviting all who take an interest in the progress of horticulture to contribute to it. The Exhibition is to comprise all horticultural productions (with the exception of wines and Grapes, which are excluded, owing to the possibility of introducing the *Phylloxera*); also tools, machinery, glasshouses, as well as collections of any kind connected with rural life and the development of garden culture.

— MR. TILLERY states that, for the last week the weather in Nottinghamshire has been very winterly, the thermometer ranging from 33° to 35° in the shade. On the morning of the 25th ult. the ground was covered with snow to the depth of nearly 6 inches, but it melted away next day, and sleet showers have been falling since with an intensely cold wind from the north-east. The Apricot and Peach bloom is yet safe, owing to its not being fully expanded; and, should the cold weather last a week or two longer, there will be all the better chance of its setting well. There is an excellent show of fruit buds on all kinds of hardy fruit trees, the past warm summer having ripened the wood well.

— A FRUITING BRANCH of the Chinese Kumquat (*Citrus japonica*), bearing fifty-six fruits, was exhibited at the last meeting of the Royal Horticultural Society by Mr. Sherratt, nurseryman, at Knypersley, Cheshire. The Kumquat, which is one of the most prolific of all the Orange tribe, bears golden-yellow fruit, about the size of a pigeon's egg. It may be propagated from seeds, but, in order to fruit it successfully it should be grafted on *Limonia trifoliata* as a stock. Mr. Fortune, who is well acquainted with this plant both in China and Japan, informs us that it would doubtless succeed out of doors in some of the warmer parts of this country, but that, to fruit it successfully, it requires a warm greenhouse temperature during the summer months. Apart, however, from its delicately perfumed fruit, the plant deserves culture as an ornamental plant.

THE GARDEN IN THE HOUSE.

A BUTTON-HOLE BOUQUET FOR MARCH.

PASSING through Covent Garden Market a few days ago, I was so much struck with the beauty and simplicity of a coat bouquet in Mr. Dickson's shop, that I send it to you for illustration. It is made up of a leaf of Lily of the Valley at the back, upon which lies one spray of that flower, mixed with four or five very small pieces of Maiden-hair Fern. These portions of a frond are so arranged that they break the hard outline of the leaf behind them, and also tone down its bright green by their glaucous shade of colour. In front of these are placed a fine thick-petalled bud of Climbing Devonians Rose. This, of course, has been properly wired, and slightly blown open. The base of the bud is concealed by two well-chosen leaves from a Fairy Rose, by which means another shade of green is introduced into the bouquet, which not only serves to set off the Rose-bud to the best advantage, but also contrasts well with the foliage previously used. These contrasts, too, are not merely variations in shade of green; their importance depends still more upon the contrasts in their form, than which it would be difficult to select three differing more widely. This bouquet, which, at this early period of the year, is a good



A Button-hole Bouquet for March.

specimen of what horticulture can do in furnishing us with valuable flowers in advance of their natural period of blooming, may be arranged two or three months hence from plants growing out-of-doors, the Maiden-hair excepted. And, even if it were a necessity that hardy plants only were to be employed in making up this button-hole bouquet, some well-selected leaves from *Thalictrum minus* would prove such an efficient substitute for the Maiden-hair fronds that ninety-nine people out of a hundred would regard it as a Fern, and not as a leaf from a flowering plant. Those who do not possess means for growing *Adiantum cuneatum* are strongly recommended to cultivate this hardy apetalous British Ranunculaceous plant, which does best in a calcareous or magnesian soil. W. T. P.

A Useful Palm Seed.—Richardson, in his African travels in the Great Desert, vol. 24, p. 323, says, "Dates are not only the principal growth of the Fezzan oases, but the main support of their inhabitants. All live on Dates—men, women, and children, and even the lower animals." New Dates called *rubeb*, will last an Arab for two months during summer, and during the rest of the year he uses the hard pressed fruit, called *adjone*. The fleshy part of Dates contains according to Remsch, 58 per cent. of sugar accompanied by pectin, gum, &c. Dates, especially when dried, are very nutritious.

VARIOUS BULBS FOR INDOOR DECORATION.

Amaryllis.—The various species of *Amaryllis* are, with few exceptions, natives of warm latitudes; and, therefore, are in a high degree suitable plants for the window of a heated room, in which they thrive remarkably well, even when not placed in a very sunny position, and produce in abundance their large, bell-shaped, red, or red striped with white, or white striped with red, flowers, which grow in umbels on strong stems. The following large-flowered kinds are the best for winter flowering:—*A. aulica*, a Brazilian species, the flowers of which are large and showy; they are of a deep red colour, the petals being veined with a deeper tinge and tipped with green, and open between October and March. It is from this species, hybridised with *A. vittata* and its numerous varieties, that M. Van Houtte, of Ghent, has raised the fine large-flowered *Amaryllises* now so well known. *A. equestris*, a native of tropical America, has light brick-red flowers. *A. Reginae*, a native of Central America and the West Indies, has dark red flowers, which usually have a lighter-coloured streak down the middle of each petal. *A. rutila*, a native of Brazil, has flowers of various shades of red. Allied to this is the species known as *A. reticulata*. *A. vittata*, a native of tropical America, has white flowers, with three red longitudinal streaks on each petal. These kinds are almost exclusively the parents of the wonderfully numerous garden varieties that are now in cultivation. One of the first hybrids raised from them was the well-known *A. Johnsoni*, the offspring of *A. Reginae* and *A. vittata*. This has deep red flowers with a white streak down the middle of each petal. By continued crossing, not only a great variety of forms with variously-marked flowers have been produced, but many intermediate varieties have also arisen which unite all the characters of the original parents in various shades and gradations of resemblance. In bringing them into flower in winter, two modes of culture are employed, and as they are almost equally good, we shall describe them separately. In the first mode, the bulbs should be potted in a mixture of two parts loose loamy soil and one part of leaf-mould, adding a little sand. The pots should then be placed in a window of the heated room. They should be watered all the year round with lukewarm water as often as they become dry, and, treated in this way, they will bloom, according to their kinds, in October and November, or from March to May. After flowering, the supply of water should be gradually diminished, and in about six weeks they should be transplanted. In doing this, the young bulbs should be removed, but the bulbs should only be loosened with a pointed piece of wood, and the roots should not be disturbed, but any that are decayed should be cut away. After transplanting, they should be watered whenever the soil becomes dry; and, if the plants are healthy, they should receive a little liquid manure from time to time, to strengthen the bulbs for winter-flowering. They may be transplanted either annually, or every two years. Under this treatment, we have seen plants of *Amaryllis* blooming every year in a warm room as finely and as strongly as in a plant-house, and showing handsome healthy leaves all the year through. This method, however, has one drawback in this respect, that one cannot be quite sure whether the plants which are treated in this way will bloom during the winter months, or not until April or May. The second mode of treatment is rather to be preferred to that just described, inasmuch as, by following it, the plants may be brought into bloom, with certainty, during the winter months. In autumn the bulbs should be potted, and placed in the warmest part of the room, but not far from the window. The pots may be placed on a Dutch stove, the temperature not being allowed to exceed 80° Fahr. If it goes beyond this, a tile or a brick should be placed under the pot. Here they should receive no water until the sheaths of the flower-stalks appear. These, under this mode of culture, are always developed before the leaves. The pot should now be placed in a window of the heated room, and thoroughly watered with warm water, a saucer being placed under the pot to receive the water that escapes from the pot. After this time the plants should be treated in the ordinary way, and after flowering should be watered until August whenever they are dry, liquid manure being given from time to time. From the beginning of August the supply of water should be gradually diminished, and after the

1st of September no more should be given. At the end of September the plants should be transplanted, the old soil of the ball being quite shaken out, and all the decayed roots removed without injuring the sound ones; and, after this, the same routine of culture should go on as in the year before. In addition to the foregoing, we must not overlook some species which have long been favourite plants for room-culture, but which have not been employed in the production of hybrid varieties. These are *Amaryllis formosissima*, a Mexican species, known also under the name of *Sprekelia formosissima*. In autumn, the bulbs of this should be laid (not planted) in the warmest part of the room, but not immediately on the stove. Here they should be allowed to remain until the sheaths of the flower-stem issue from the crown. Then they should be potted, placed in a window of the heated room and watered whenever they become dry. In two or three weeks, and before the leaves appear, the large, solitary, deep purplish-red blossom will open on the top of the stem. After flowering, the treatment should be similar to that of the *Amaryllises*, which, according to the second mode of culture which we have described, are kept dry after being planted until the flower-buds appear. In September the bulbs should be taken out of the pots, and the same treatment repeated as in the previous year. *Amaryllis solandræflora* var. *vittata* is a native of tropical America, and has very large funnel-shaped flowers, which are, in the ordinary form, green, but in the variety called *vittata*, are of a dull white, with two reddish longitudinal streaks. It should be treated according to the first mode of culture described. *Amaryllis* (*Nerine*) *sarniensis*, *A. (Nerine) undulata*, *A. (Vallota) purpurea*, *A. Belladonna*, and *A. blanda* are all natives of the Cape of Good Hope. When grown in the window of a room they bloom in September, and, therefore, do not properly belong to the class of winter-flowering plants; they are all handsome plants, but *A. undulata* is the only one which blooms annually. The others are often very tedious in blooming, and are, therefore, not to be recommended, notwithstanding their beauty.

Grape Hyacinths (*Botryanthus*). These pretty dwarf bulbous plants, with blue flowers in dense clusters, and better known as Grape Hyacinths, are various species of *Botryanthus*. They are natives chiefly of the vineyards and pastures of Southern Europe, and are known in gardens under the name of *Muscari*. *B. odoratus* and *B. vulgaris* both have dark blue flowers, while those of *B. pallens* are sky-blue. When the leaves are withering, the bulbs should be taken up and left to dry in a dry shady place. In the end of August or the beginning of September, they should be planted, four to six together, in 4 or 5-inch pots, and placed in a cool position sheltered from frost. They should not be watered. In the beginning of December they should be removed to a room where the temperature is kept above freezing point, or moderately warm; here they should be watered. When the flower-buds begin to show, the plants should be placed in the window of the temperate room, where they will come into bloom in January or February, according to the heat of the room. After flowering, they may be kept through the summer in a dry place, where no water should be given to them, and, without being transplanted, they may be forced again the following winter.

Clivia miniata.—This is one of the finest and most free-blooming of bulbs for flowering in February, March, and April. Its vermilion flowers, which resemble those of a small *Amaryllis*, are produced in a large umbel of from eight to fifteen blooms on the top of a stem 6 inches to 1 foot high, rising from the midst of evergreen ribbon-like leaves, arranged in two rows. The culture should be according to the first mode given for the *Amaryllis*. The other species of *Clivia* also make good room plants, although none of them are as handsome as *C. miniata*, or bloom so freely and abundantly when grown in rooms. *C. nobilis*, from South Africa, is the longest-known kind. Its flowers are of a pale red, considerably smaller than those of *C. miniata*, and appear in February and March. *C. Gardeni*, from Port Natal, is handsomer than *C. nobilis*, but not so fine as *C. miniata*; moreover, it frequently does not bloom before summer. *C. cyrtanthiflora* is a hybrid between *C. nobilis* and *C. miniata*, and blooms at the same time as *C. nobilis*.

Crocuses.—Most of the species of *Crocus* are natives of the mountains of Switzerland and the south of Europe, where they bloom soon after the snows melt in spring. The species with blue and white flowers are *C. vernus* and *C. biflorus*. The parent of the yellow-flowered kinds is *C. luteus*. Those with streaked, or variegated, flowers have sprung from *C. reticulatus* and *C. versicolor*. The treatment is the same as that for *Botryanthus*, only that as soon as the flower-buds appear, the plants may be removed into the heated room to flower. Care should be taken not to place them in the heated room before the flower-buds show themselves; otherwise these will not make their appearance at all. But when the growth has already reached this point in a cool or temperate room, the flowers will open in a few days after the plants have been removed to the heated room.

Dog's-tooth Violet (*Erythronium Dens-canis*).—This is a native of the European Alps and Siberia. The two oval radical leaves are marbled with brownish spots. The flowers are drooping, and of a rosy colour, somewhat like those of a *Cyclamen* in shape, but considerably larger. It should be planted in a mixture of equal parts of loam and peat. The bulb-like root-stocks should not be allowed to dry too much after they are taken up; they should be potted in August, and kept without water in a cool place until the middle of December; they should then be removed to the double window or the window of a temperate room, where they will come into flower in January and February.

Eucharis amazonica, **E. candida**, **E. grandiflora**.—These are all natives of tropical America, and rank amongst the handsomest of plants for winter-flowering in rooms. Their flowers are white and fragrant, and are produced in umbels on the top of a naked flower-stem, like those of a *Pancratium*. Their treatment should be according to the first mode given for the *Amaryllis*. The flowers appear at different periods in the course of the winter.

Fritillarias.—Of this genus only the Snake's-head (*F. Meleagris*), a native of Europe, and the pale-flowered kind (*F. pallidiflora*), a native of Central Asia, are to be recommended for winter flowering. The common kind (*F. imperialis*) comes too late into bloom. The original *F. Meleagris* has flowers which are chequered with brown squares, on which account the name of Chess-board Plant has been given to it; but there are varieties with light speckled and even white flowers. *F. pallidiflora* has pale yellow flowers. They should be treated like *Botryanthus*, but should be kept only in a temperate room, where they will bloom in February and March.

Ismene calathina.—This is a native of Brazil, and is allied to *Pancratium*. It bears two or three large white (sometimes yellowish) fragrant flowers on the top of a stem from 1½ to 2½ feet high. It should be treated according to the second mode of culture given for the *Amaryllises*. The flowers, however, do not appear until the leaves are almost fully grown. Water must therefore be given as soon as the latter begin to show themselves.

Iris.—The bulb-like root-stocks of the Persian Iris (*I. persica*) should be potted four or five together in 5-inch pots in loamy soil in October and placed in a cool room. After the middle of December they should be removed to the heated room. It is a very easily forced plant, and blooms from the middle of January. The flowers are variegated with pale blue on stems about 9 inches high. After flowering they are to be treated like the Hyacinths. *I. reticulata* is a native of the Caucasus. Its bulbs are covered with a reticulated coat, from which the species derives its name. In the open air it blooms at the same time as the Snowdrop, and is forced in the same way as the Crocus. The flowers are blue. When potting, eight or ten bulbs should be put into each pot. *I. Xiphium* and *I. xiphioides* are both natives of South-western Europe, and have bulb-like root-stocks and flower-stems about a foot high, narrow leaves and large flowers, which vary from deep blue to nearly white, and are variegated in various ways. The first is also known in gardens as *I. hispanica* and the other as *I. anglica*. They should be placed in the heated or cool room about a month later than *I. reticulata*. In other respects the treatment is the same. *I. susiana* is a native of the east, and one of the handsome kinds with large flowers,

which are veined and spotted with brownish-purple on a grey ground. The plants should be potted in loam well-mixed with sand, in August or September. They should not be watered, and in February the pots should be placed in a sunny part of the double window, and in a temperature of from 40° to 48° Fahr. Here they should be watered very carefully, and as little as possible. The truly handsome flowers appear in April. In other respects the treatment is the same as that of *Cyclamen persicum*.

The Spring Snow-flake (*Leucojum vernum*).—This is a native of Central Europe. Treatment the same as for *Botryanthus*. It blooms with the Snowdrop from the middle of January.

Pancratium speciosum.—This is a native of the East Indies, and is one of the handsomest and most distinct bulbs for winter-flowering in the heated room. The large white flowers are produced in umbels in November and December. It should be treated after the first mode given for the *Amaryllises*.

Puschkinia scilloides.—This comes from the Caucasus, and bears clusters of pretty bright blue flowers, like those of a *Scilla*, on stems 8 or 9 inches high. Treatment the same as that of *Botryanthus*. It is known in gardens as *Adamsia scilloides*.

The Asiatic Crowfoot (*Ranunculus asiaticus*) is a native of the East. Its pretty double-flowered varieties are well known in gardens. For forcing, the sub-species, known as the Turkish *Ranunculus*, is the best. The roots intended for forcing should have been previously laid in a dry room without any soil for at least two months, if a good result is expected. Those intended for the earliest flowering should be potted at the end of August, and the rest should follow at intervals of from seven to fourteen days. Before potting, the roots should be soaked for some hours in water, and then potted, four or five together, in 4-inch pots, in free loam. The pots should then be placed in the window of a temperate room or in the double window, when, from January forward, according to the time of potting them, they will come into flower. None of the *Ranunculi* should be forced to flower in the heated room, as they cannot bear such a high temperature.

Squills.—The two-leaved Squill (*Scilla bifolia*) is a native of the forests of Western Europe and Switzerland, with loose clusters of sky-blue flowers on stems from 3 to 5 inches high, and blooming shortly after the *Leucojum*. The Caucasian, or Crimean variety (*S. bifolia* var. *taurica*, Rgl.), which is a more robust plant, about 9 inches high, bearing numerous flowers in clusters, is still finer than the common form. *Scilla cernua* is a native of Eastern Russia and Siberia, and handsomer than the preceding kind. There are often not more than one or two flowers on each stem, but each bulb produces many stems, and the flowers are much larger and of the deepest sky-blue colour. This is also known in gardens and horticultural works as *S. sibirica*, *S. amoena*, and *S. amænula*. *S. bifolia* and *S. cernua* are to be treated in the same manner as *Muscari*. They bloom in the end of December and beginning of January. *Scilla campanulata*, *S. nutans*, and *S. patula* are all three natives of Southern Europe, and are closely allied to each other. They are known in gardens as Roman Hyacinths and *Hyacinthus non-scriptus*, and are also classed as genera under the names of *Agraphis* and *Endymion*. They have broader leaves than the two preceding species, and stems more than 9 inches high, with looser spikes, which usually contain a greater number of flowers of a blue or white colour. If the bulbs are taken up soon after flowering, kept dry, and potted in August, or the beginning of September, four or five together in 5-inch pots, they will come into flower in November. The treatment is to place them in the cool room in the beginning of October, and fourteen days afterwards to remove them to the heated room.

Tulips.—The common Tulip is a native of the East, and is the parent of the numerous garden varieties. *T. suaveolens* and *T. præcox* are natives of Southern Europe, and are the parents of the kinds used for forcing. The treatment is the same as for the Hyacinths, only we must remark that the *Duc van Thol* should be potted in September for forcing, placing single bulbs in small pots or from three to five bulbs together in 4-inch pots. In October they should be placed in the cool

room, and in November removed to the heated room, when each pot should be covered by another larger pot, inverted. They will bloom by the end of November. The hybrids from *T. præcox* and *T. gesneriana* should be potted at the same time as the Hyacinths, three bulbs together, in 4 or 5-inch pots, and placed in the cool room in December. In January they should be removed to the heated room. The common Tulip and its varieties should not be placed in the heated room before the end of February. We recommend the following kinds for forcing. (1) From November to the middle of January:—The single *Duc van Thol*, with red and yellow, pure yellow, red and white, pure white, scarlet, crimson, golden variegated, and fiery red flowers; and the *Duc de Berlin* in similar colours, but with larger flowers. (2) From January to the end of February:—Single: *Clairmond*, *Vermilion brilliant*, *Feu de Moscou*, *Duc de Paris*, *Duchesse de Parme*, *Aimable Elizabeth*, *Etendard d'Or*, *Canary*, *Bride of Haarlem*, *Commander of Malta*, *King Pépin*, *Wapen van Leyden*, *Catherine Isabella*, *Belle Sylvander*, *Laque Triomphante*, *Paragon van Grieken*. Double: *Duc van Thol*, *Rex Rubrorum*, *Couronne des Roses*, *Le Blason*, *Tournesol*, *Duke of York*. (3) From February to April:—Single: *Pottebakker*, in yellow, red, and white. Double: *Geel Rose*, *Grand Maître*, *Pourpre*, *Agréable*, *Sylvia*, *Wittenrod Bordé*.

Veltheimia viridifolia.—This is a pretty bulbous plant from the Cape of Good Hope. From amid the broadly lancet-shaped leaves rises a flower-stem from 1 to 1½ feet high, bearing on its summit a dense cluster of tubular pale rose-coloured flowers. In winter it should be placed in the double window, or in the window of a temperate room, where it comes into flower in March; and in summer it should have a half-shady position in the open air. It should be watered moderately throughout the summer.

M.

Gardeners' Wages Five Hundred Years ago.—In these days of high wages it may be interesting to note the wages of a head gardener 503 years ago. In 1372 John of Gaunt issued a warrant, which is still in existence among the archives of the Duchy of Lancaster. It is addressed to his receiver-general, and having recited the engagement of one Nichol Gardiner as "nostre gardynere"—the surname and the office being differently spelled—for "nostre manoir de la Sauvoye," it proceeds to define his duties and emoluments. Nichol, we observe, is to have all the fruits and "herbages" for his own profit, saving only what is required for the household, but is to manure and work the garden at his own cost and charges, and to provide all things needful, "busoignable," for its due cultivation. The Duke, on the other hand, stipulates to provide him with rails and fences in the railing season, "en temps de raillement," and for wages commands the receiver to pay him the sum of twopence a-day whilst he is retained as gardener, or, in the old Norman French of the period, in which the warrant is written, "deux deniers chascun jour le temps qu'il serra ensi gardynere."

Single White Hepatica.—Miss Hassard alludes to the value of the flowers of the Hepatica in bouquets, but she mentions only the pale blue and the double pink. The blue kind, known as *Angulosa*, has large flowers; so also has the single red; and those of the double blue are large, and of a deep hue of colour. Foremost amongst all of them, however, is the single white, which is a veritable gem, and is one of the prettiest of early spring flowers. I commend this amongst all others to bouquet makers, because its earliness, its colour, its size, and its beauty, make it especially valuable for button-holes.—A. D.

Boxwood as a Scraper.—Where Boxwood does well, a mass of it on each side of a door proves a capital scraper or mat in wet or snowy weather. The only time during which it cannot be used much is when it is making its growth, but at all other seasons it may be used in moderation for cleaning the feet; and, if done with any degree of care, the drawing of the sides, toes, and heels of boots over it, injures it very little, and, of course, it is cleaned after every shower of rain. Where a flower-border runs round the house, the ordinary Box edging will do, if allowed to grow larger than ordinary near the door; but, on gravel, it might be planted in the form of a figure, such as a comma, a square, or a half-moon, or any other shape desired.—CHEVALIER.

Anti-rabbit Composition for Young Trees.—There have been enquiries in your paper and others of late about the best anti-rabbit composition. Until last year, we have for a long time here used—with the best results—a mixture of lime, water, and cow-dung, made pretty strong. There should be plenty of the latter ingredient, both to make it adhere properly, and because, if lime is in excess, the mixture dries too white upon the trees, and is unsightly; whereas, if properly mixed, it dries just the right shade of greenish-grey. But last year we discovered a simpler, cleaner, and equally effective composition, which is sold for the purpose by Messrs. R. Davidson, of the Scottish Colour Works, Leith. It is very cheap (a 56 lb. cask has lasted two seasons here), and is quite inoffensive to touch or smell. Being semi-transparent, it is invisible when applied to trees. Most trees outgrow danger from rabbits; which, as a rule, will only attack young trees; but Hollies and Laburnums are never safe, and the largest specimens are liable to destruction by these little pests.—SALMONICKERS.

THE FRUIT GARDEN.

VINE EYES IN TURF.

THE season is now at hand for commencing to raise young Vines, either for pot culture or for planting out, and many gardeners have not the convenience of a propagating-house or other suitable structure for the purpose. In the spring of 1859 I was similarly situated, for I had removed two Vines of the White Nice variety, which were to be replaced by eyes from a favourite Muscat which we had. Wishing to fill up the blanks thus made as speedily as possible, I placed a slate upon the hot-water pipes of the Vinery, which were about 3 feet 6 inches from the glass, procured a fibrous sod, about 12 inches square and 2½ inches thick, and into this inserted, in a slanting position and up to the buds, nine Vine eyes, only two of which would eventually be needed. I watered the sod three or four times a day, according to the heat of the pipes, with water from which the chill had been taken; in fact, I kept it constantly saturated. Both roots and buds soon began to push, and, when the former were sufficiently advanced, I cut out two of the strongest, with a sod about 4 inches square attached to them, which was well filled with roots. Procuring another sod 10 inches square and 3 inches thick, I turned it upside down, and cutting a hole in the centre 4 inches square, I placed in it, a little deeper than before, the rooted eye with the smaller sod. As I kept it constantly moist the roots spread rapidly and the young shoots soon became strong. As the roots appeared at the sides of the sod I cut off the points with a sharp knife, which caused a quantity of side roots to push, and as soon as the sod was well filled with them I raised the slate off the pipes for a few days to harden them off before planting out. To prevent the young roots taking a downward direction, which they are generally inclined to do, I then made a hole in the border large enough to admit the slate, and then planted all together, leaving the slate to give the roots more of a lateral direction, and watering the whole to settle down the soil. The Vine not receiving the slightest check was soon at the top of the rafter. After having the centre pinched out at 4 feet from the starting point, it finished off two splendid canes, which were allowed to carry two bunches each the following season. I was so well satisfied with the results of my experiment that I have practised it ever since, both for planting out and for fruiting in pots. In the latter case I merely cut the second sod in a circular shape according to the size of the pot intended to be used. Treated in this way the young growth never receives the slightest check in re-potting, an advantage that should always be kept in view, either in raising young fruit trees or plants.

JAMES SMITH.

Waterdale, St Helens.

APPLICATION OF SULPHUR TO VINES.

I HAVE letters on this subject from several persons interested in Grape growing, and as it is one of considerable importance, I may state that the period when red spider is most likely to appear and increase on Vines is when the fruit has commenced to colour. Syringing is then suspended, to admit of this being accomplished perfectly. If red spider has gained a footing before this, it is sure to make more rapid progress afterwards, when no obstruction is offered; so that it frequently happens that by the time, or sometimes before, the fruit is ripe, the whole is overrun by this pest. The question which thus arises is whether or not the sulphur necessary to annihilate the spider would injure the fruit, but I am of opinion, if it be carefully used, that the spider may thus be disposed of without blemishing the fruit. Some years ago, I remember a Muscat-house which was overrun with red spider when the crop was all but ripe. The flow-pipes were painted with sulphur, and the fire lighted in the evening, when the house was closed and cool, until the temperature reached 90°. The fumes at this stage were very strong. The fire was then withdrawn, and the house allowed to cool down again. The operation was repeated the following evening to the same extent; next day the spiders were all dead. The bunches were closely examined afterwards, and the only damage that a few of the berries had sustained was a slight spot here and there, similar to that which sometimes appears on highly-ripened Muscats, and is known as the "robin egg spot." The flavour and keeping qualities were in no way diminished, while the wood was greatly benefited in having no spider to retard its ripening. The fumes of the sulphur were stronger in this instance than I had ever before known, and the spider was as plentiful as it is in most cases. I have seen other instances where the spider was not so bad nor the remedy so vigorously applied, and the result was the same. Muscats are as tender in the skin as any other kind, so that I consider red spider may be killed on all Vines and at all times without the slightest injury being done to the fruit.

J. MUIR.

RUST ON GRAPES.

YOUR correspondent, "J. M.," is right, so far as he goes, in his observations respecting rust on Grapes, and his testimony will be endorsed by others who have given some attention to this subject; but the real question is, What is rust upon Grapes, and how does it affect the fruit? Your correspondent has answered the last part of this question, "it only affects the appearance of the fruit;" in fact, it is hardly skin deep; for, if anyone examines a berry, affected by rust, through a strong magnifying glass, he will see at once that the beautiful smooth skin of the berry has been decomposed by condensed moisture when the berry was in a young and tender state. Anyone may satisfy himself upon this point; although it may not be observed upon the green berry, it is nevertheless there, and expands with the growth of the fruit; thus it follows as a natural consequence that tender and thin-skinned Grapes will be most easily affected by rust. If my inference be right, I believe that the system of steaming night and morning that many pursue when their Grapes are in flower, in cold and sunless weather, is detrimental to the berries and young fruit. This practice, when Grapes are in blossom, is unnatural, and the wonder is, that so few evil consequences arise from it.

J. T.

Opening up the Hearts of Standard Fruit Trees.—In many gardens one sees plantations of fine young Apple trees mop-headed, and the branches growing hither and thither, twisted and contorted—evils caused by summer pinching and bad pruning. Our practice is to leave all the growth on our trees, which are chiefly pyramids, till August and September; all shoots are then shortened to three or four buds with the exception of the leading shoots, which are left till after all the leaves are off; they are then shortened to the length wanted, a matter depending entirely on the size of the tree. If the trees are inclined to grow upwards too much we drive in six short stakes around the base, run a strand of wire round these, and with tar-cord tie the branches down to the wire and stakes; in this way the tree is opened up; light and air are let in about the branches, and, in short, a uniform thrifty-looking tree is the result of a little trouble in tying down a few of the main branches. Care must always be taken in shortening these branches not to prune to an inside bud; this may appear a slight matter at first sight, but it is of the utmost importance if you want a uniformly handsome tree to prune to an outside bud. In this way the tree gets outwardly developed, and relieves itself of overcrowding on the inside. It is to be hoped, now that we are ceasing to turn our kitchen-garden borders into ribbons, more attention will be paid to our hardy fruits and finer legumes than has hitherto been the case.—CHEVALIER.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Peaches Setting.—I do not think that Peaches ever set better here than they have done this year in our first and second Peach-houses, and we certainly never had more dark or more unfavourable weather when the trees were in flower. We, however, fired up well during the day, dropped the temperature at night, dashed the trees and flowers with a fine syringe several times a week, and almost every flower has set.—J. S. W.

Planting Alpine Strawberries.—Runners planted now, or as soon as the weather breaks, in rows 1 foot apart, and 8 inches asunder in the rows, in land well manured some time previously, will come in usefully in August and the two following months. When the plants are well established, mulch heavily with manure. Cut off all flowers that appear before the end of July. Seeds sown now in heat, pricked off when large enough to handle, and planted out in May, will bear in the autumn.—E. HOBDAK, Ramsay Abbey.

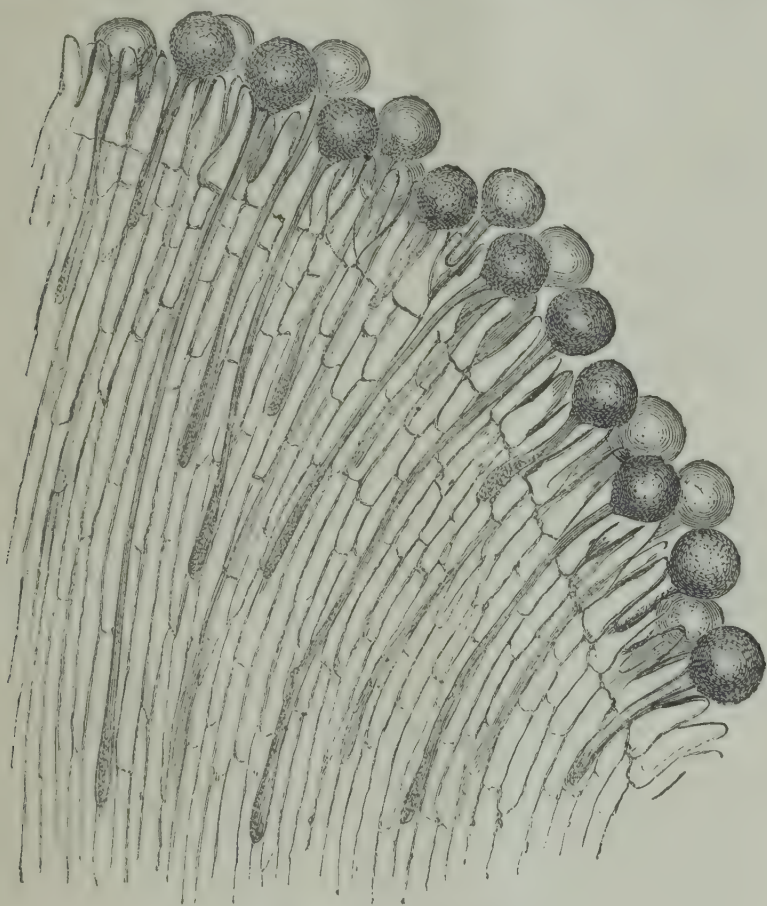
Gros Colman Grape.—Mr. Greenfield, of the Priory Gardens, Warwick, writing in the "Gardener" for February, says, with regard to this fine late Grape, "Allow me to endorse Mr. Thomson's statement respecting this fine late Grape. I think the same terms apply to the Gros Colman as to the Raisin de Calabrie. When it is well grown it is a splendid Grape. It is a Grape that requires to be started early (say February), and allowed plenty of time to finish. It swells immense berries, like Plums; colour and flavour unsurpassed as a late black Grape."

Waltham Cross Grape Vine.—When sent out I procured two plants of this 8 inches in height; one was planted out in the Cucumber-house at one end of the bed, its roots being confined to a space 3 feet square and 8 inches deep. Here it produced and ripened a fine cane, and by the third week in June following it ripened off in perfection eleven bunches of Grapes, each averaging in weight 2½ pounds, and of the finest golden-amber colour. The other Vine was planted out in a Vinery in the spring of 1874, and was allowed to ripen two bunches, each of which was 2 pounds in weight. They were ripe the first week in August and kept good on the Vines until the first week in December.—RICHARD NISBET, Aswarby Park.

Pear Naquette.—This valuable early Pear, Naquette, is sometimes confounded with the Autumn Bergamotte, but it is quite distinct, and ripens much earlier. The trees of both these varieties attain a large size, and the fruits are somewhat similar. The fruit of the Naquette is larger, rounder, and greener than those of the Bergamotte, and ripens quite two months earlier. It is also more juicy than the Bergamotte, but the flavour is not quite so rich. I have large trees 20 feet high of both sorts, and I think I may venture to say that I know both well. This Pear is not much known in this country, but as an exquisite early variety it deserves extensive cultivation, as much for its flavour as for its heavy cropping qualities.—JOHN SCOTT, in "Gardeners' Magazine."

FERTILISATION OF FLOWERS.

WE have recently heard much from scientific men and horticulturists respecting the part which insects take in the work of intercrossing our wild flowers. In modern times man himself has commenced improving cultivated flowers, and the result is to be seen in the hundreds of beautiful varieties of Pansies, Pelargoniums, Asters, Chrysanthemums, Cyclamens, and other favourites that now grace our gardens. We know of no source of amusement more interesting than the experimental intercrossing of two varieties of any popular flower when both are in bloom. A pair of fine-pointed scissors to remove the anthers or pollen-cases from the seed-bearing plant, and a camel's-hair brush to transfer the pollen from the anthers of one to the stigma of the other, are all the implements required for the operation. The pollen is the yellow powder-like substance found in most flowers, in some of which—the Lily for example—it is very conspicuous, and after it is applied to the stigma a curious process takes place. Each pollen grain throws out a tube, as shown in our illustration, and this forces its way down the cellular tissue of the style into the ovary below where fertilisation takes place. These tubes serve the purpose of transmitting the fluid contents from the pollen grain to the embryo ovules in the young seed-vessel. This curious growth of the pollen grains takes place occasionally with great rapidity; and, in some plants—the common Crocus for example



Pollen Grains magnified.

—the tubes have to force their way for several inches down through the tissues of the style. Our knowledge of the process of fertilisation, as carried on in different plants, enables us to obtain new varieties, and these, by blending the characteristics of both parents, are in many cases far more beautiful in colour and form than either of the sources from which they have sprung.

B.

Value of Land in Ireland.—It is stated, in "Thom's Almanac" for the present year, that the average price of land sold in the five years ending 1867 was 17½ years' purchase; in 1868 it rose to 18½ years; in 1869 it fell to 17½, and in 1870 to 16½ years. In 1871 (the first year of the Land Act of 1870 being in operation) the price rose to 18½ years; in 1872 to 19 years, and in 1873 to 20 years' purchase. The annual valuation of lands, houses, and tenements, in Ireland, is upwards of 13 millions. If we deduct three millions for the valuation of houses and tenements, it will leave ten millions as the value of the land. We may probably add one-fourth to this valuation, which would make the rental 12½ millions. The increase between 1870 and 1873 was three and a half years' purchase, which represents a capital of £43,750,000 added to the value of the estates of the land-class by giving greater security to the tenants.—"Irish Farmers' Gazette."

THE INDOOR GARDEN.

THE NEAPOLITAN VIOLET.

THE Neapolitan has had many rivals among Violets; yet it still maintains its position as the best. The individual flowers are the handsomest of all the double varieties. The colour is delicate, and the scent of a peculiar sweetness; its stiff shining green leaves, with the flowers bristling just above them, give it a much more handsome appearance, as a plant, than any of the other varieties. Like most spring flowers, it is particularly well adapted for forcing in winter; no plant of the same size yields bloom in such profusion, or that lasts longer. The same plants will go on blooming, more or less, from the 1st of October till April. This Violet is hardy on the south-west coast of England, and in inland counties blooms in the open air, during mild weather, throughout the winter. In the north it can scarcely be called hardy, and, except in sheltered nooks in the south, the flowers suffer from frost. To have them in perfection, and keep the plant in full vigour of health, so as to obtain a continuous crop of flowers, it is necessary to protect it with glass. This is what is called Violet forcing, though in reality the plant is impatient of heat, except in a very mild form at the root—and even then heat is sometimes more productive of leaves than flowers. Success in forcing Neapolitan Violets depends more particularly on the preparation the plant has received during the previous summer, than on the immediate means used to bring out the flowers; that is, the flowers must first be grown before they can be made to open. This month is a good time to begin preparing Violets for the following winter's flowering. Get two or three lights of a cold pit or frame in readiness by putting in 4 inches of soil, consisting of sandy loam and leaf mould sifted fine. From the plants which are under glass and in good health, free from red spider on the leaves, and with their foliage undamaged in any way, proceed to take off side shoots for young plants. Select the short stout shoots or runners with a bunch of young white roots attached, which they are sure to have at this season; avoid long wiry horizontal runners, for they are of no use; avoid, also, old crowns which have been flowering all the winter, as these are not worth having in comparison with the young side shoots. Insert them in the frame in rows 3 inches apart each way, and water them in with a watering-pot having a very fine rose. Draw the lights over them, leaving a little air on, except during frost; shade from bright sun for a few days, and, by the middle of April there will be a number of sturdy plants to be transplanted to their summer quarters; or the old plants, after flowering, at the end of March may be lifted and pulled to pieces, and a sufficient quantity of the young stiff side-shoots, which have already made a bunch of roots, selected from amongst them. These can be at once planted in the ground chosen for growing them in throughout the summer, but the first is the preferable plan. By adopting it, the young plants receive no check when planted out during the moist weather of April, when they should be in the most active growth; they also are better able to get a good hold of the soil before the hot dry weather of summer ensues. The choice of a good position in which to grow these Violets is a most material point in their culture; and a moist border, under a wall or hedge facing the west, will be found to suit them admirably. The plant delights in a somewhat stiff soil, with plenty of moisture to feed upon during the hot days of summer; if planted in a dry soil facing the sun, it invariably becomes a prey to red spider, the foliage gets injured and exhausted, and a crop of flowers is out of the question. The same ground may be occupied year after year by Violets, if the ground be dug in winter, and a light dressing of thoroughly rotten manure (or leaf mould, if the soil be heavy) be worked in. About the middle of April, the prepared plants should be removed and planted in their summer quarters, care being taken to preserve the balls entire. Plant them with a trowel a foot apart each way, making, with the foot, the ground firm about the plants and between the rows, and finally watering them. They will want no more water for weeks, or until, under the influence of dry weather, the soil may show signs of requiring it, when the whole should be watered thoroughly. The summer

culture, besides watering, only consists in keeping the ground clear of weeds, and cutting away all the wiry horizontal runners as they appear; they will not be very troublesome until August, and the most effectual means of getting rid of them is by the use of Grape-scissors, the fine point of which reaches the base of the runner amongst the thick bunch of leaves, without the danger of cutting the leaf-stalks instead. By the first week in October the plants will be coming into bloom, and then is the time to have them removed to pits for the winter. In the south, all that is necessary is to fill the pits with any good friable soil to within a foot of the glass, sloping it from back to front; in this plant the Violets with their roots lifted with balls of soil entire, and place them as closely together as they will pack. The balls are, as a rule, so large in proportion to the tops that the plants above ground will be wide enough apart. In the northern parts of the country it will be necessary to place a body of leaves, or a mixture of leaves and litter, under the soil, to produce a gentle and continuous bottom-heat during the early part of winter, in order to keep the plants gently growing, and to exclude sharp frost. The plants must be kept dry, removing the sashes in fine weather, and not allowing a drop of rain to fall on the plants, as damp is their great enemy in winter, especially in pits, where bottom-heat must be used. Damp is not so troublesome in cold pits in the south, provided the plants be kept from rain. They must be frequently looked over, and all damp and decayed leaves removed. The surface of the soil may be sprinkled with dry sand if damp be causing damage. Frost must be excluded by covering up the pit with a thick coat of dry litter, and lining the outside with the same material. Sometimes it will be necessary to keep the pit closely covered up for days or even weeks during severe weather; the flowers open but slowly at those periods, and will be found to be without scent, which will, however, return with a few hours' exposure to sunshine and fresh air. Red spider is the Violet's greatest enemy; it is hopeless to contend against it by syringing or sulphuring the plants; when spider attacks them in a determined manner, it is a sure sign that the plants are growing in an unfavourable soil or position, or are too dry at the roots, and a radical change in the management must be effected; no half-measures will be satisfactory, but spider will not be troublesome even during the heat of summer if the plants are allowed abundance of nourishment at the root.

W. D. C.

LATE-FLOWERING LILIUM AURATUM.

THIS Lily succeeds well enough out-of-doors in some parts of England, but here, in Yorkshire, at a considerable altitude, it does not, although it is hardy, produce its flowers in perfection in the open air. To flower it well it must be grown in a greenhouse; and, however cool this structure may be, it will come into flower long before it is wanted. To keep it back, about three years ago, I kept the bulbs, after potting them in a cold pit during winter and spring, in a north aspect, and afterwards, during the summer, the plants were set behind a high north wall out-of-doors, in as cool a situation, in fact, as we could find for them. Notwithstanding this treatment, however, they persisted in opening their buds about the end of July, and the flowers were inferior in size, colour, and fragrance—in consequence, no doubt, of the plants having been grown entirely in the shade all the season. The following year I tried the experiment of planting the bulbs in the herbaceous border just after they were started in the pots, but with no better success; for, though we had a few later flowers, most of them had to be cut and sent to London with the other flowers during the season, as it was not wished that they should "blush unseen." To continue the experiment, the roots were left in the ground all the winter, and, whether owing to the later ripening of bulbs or the coolness of the soil I cannot say, but the stems the next season (1874) did not appear above ground till May and June, and were much weaker in appearance than in the previous year. But they were late enough this time, the first of the flowers not opening till near the end of October; and, frost coming at that time, we cut the spikes with what expanded flowers they had, and stuck them in the vases in the house, where the remaining buds opened freely and lasted for more than a fortnight. The bulbs were taken up in November last and potted in good but dry soil, and kept in the fruit room till lately without the bulbs moving perceptibly; but, as the temperature rose the other day, we moved them into the ice-house, where the thermometer stands generally about 36°.

The soil about the roots being comparatively dry, and the pots not being in actual contact with the ice, I hope to keep them at rest till May or June, when they will be taken out and grown on freely under glass, so as to have them in at the desired time.—"Field."

PROPAGATING DOUBLE PRIMROSES.

IN answer to your correspondent who inquires about double white Primulas, allow me to say that the old plants may be broken up, and the cuttings struck in a brisk and rather moist heat in April or May, each cutting being placed separately in a thumb, or small 60-sized pot, with the soil pressed firmly round the crown. When fairly rooted, they should be shifted into a 4-inch pot, and again placed in a rather moist heat until they begin to take to the fresh soil, when they should be transferred to a more airy house, and placed upon a shelf, as near to the glass as possible, without actually touching it. As they fill their pots with roots, they may afterwards be potted on. Care must be taken not to overwater the plants after re-potting, for if the soil gets too wet before the roots have begun to work in it, they will not take to it kindly; but, when once established, they must not be allowed to get dry. It is well to shade them slightly from the strongest sunshine in summer, but be careful to remove the shading immediately the sun-heat diminishes, or that substantial growth so essential to all soft-wooded plants for winter forcing will be lost. The soil I have found to suit them best is a compost of three parts of good turfy loam, one of peat, and two of leaf mould, with a liberal addition of silver-sand, and also a little well-rotted dung. A great mistake is often made in potting these Primulas by leaving a portion of the stem (below the collar of the plant) above the soil; for this renders them very liable to damp off. They should always be potted up to the crown, but not so deep as to bury it; so that the bottom leaves just rest upon the surface of the soil. A temperature of 55° to 60° should be maintained throughout. There are several varieties of double Primulas in cultivation, but the best white I know is *delicata*, the flowers being large, full, and beautifully fimbriated.

BEN. MATTHEWS.

The Nurseries, Ponder's End.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Pots that Exclude Worms.—I chanced to see some pots the other day which had come with some plants in them from the south of Spain. They have no hole for drainage at the bottom at all, but they have one at about a quarter of an inch from it in the side. The gardener says that where one worm finds its way into one of these pots, ten would do so with those we ordinarily use.—W. EW BANK, *St. John's Vicarage, Ryde.*

Ready Way of Propagating *Cissus discolor*.—This is one of the most desirable of plants for draping baskets in the stove. Every bit of last year's wood cut now into pieces two joints long, will root in sandy peat, with a sprinkling of sand on the top; place half a dozen cuttings round the side of a large 60-sized pot, and plunge them in a bottom-heat of 75° or 80°.—E. HOB DAY, *Ramsey Abbey.*

Planting out Large Camellias.—Your correspondent (see p. 168) cannot do better than plant out his large Camellias at once. Let him cut away all their strong roots; even if they are as thick as one's arm he need not hesitate to remove them. About ten years ago, I removed some fifty plants of Camellias of thirty years' standing, pruned all their roots to within 15 inches of the stem, trenched the border, adding some fresh turfy soil to it, and not one of them failed to do well.—HENRY GADD, *Wollaton.*

Stewart's Double Chinese Primrose (*Primula sinensis Stewartii*).—This is an excellent strain of double pink Chinese Primula. It is remarkably robust in habit, even as much so as any of the common single seedlings; and its flowers, which are produced in profusion, are very large and perfectly double, while their light crimson colour attracts every one who sees them. Some plants of this variety, received from Messrs. Stewart & Sons, of Dundee, have this winter been very brilliant.—W. DICK, *Canford.*

Camellia *valtevedra*.—Allow me to inform all lovers of Camellias that, if they have not this variety, they should get it at once. It is strong in constitution, good in habit, a profuse bloomer, and, as regards form, the blooms are perfect models, being full of petals to the centre, in which they stand up, while the side petals lie down and are imbricated in the most regular manner. In colour they are the softest and brightest rose imaginable, and occasionally they have a dash of white at the tip.—N. H. P.

Hardy Plants under Glass.—Mr. Ewbank (see p. 175) and "D." (see p. 115) enquire for good hardy plants to grow under glass. For spring decoration of their greenhouses they will find few better plants than the common large-leaved Saxifrages (of the *Megasia* section)—especially *S. ligulata*. The flowers last a long time on the plant, and if cut they are excellent as cut flowers in glasses, or for ladies' hair. Many other Saxifrages do equally well, and probably *S. Cotyledon* never flowers so well out-of-doors as under glass.—H. N. ELLACOMBE, *Bitton Vicarage.*

How to Treat *Gleichenias*.—Would you give me some hints as to the cultural requirements of the South Australian Ferns *Gleichenia*, more especially *Speluncea*?—JOHN MARTEN. [*Gleichenias* may be grown in a flat pan, as they are surface-rooting Ferns, and they do best in a fresh open compost of fibrous peat, turfy loam, and sand. The peat and loam should be broken into lumps the size of pigeon's eggs with the fingers, and the pans used should be perfectly clean, and well-drained. *G. Speluncea* grows well in a moderately humid plant-stove or warm greenhouse, and requires careful and regular watering at the root when growing, and it should never be allowed to become root dry. Use tepid water, and carefully shade the plants from bright sunshine.—B.]

THE FLOWER GARDEN.

DELL'S ORNAMENTAL CRIMSON BEET.

BESIDES being useful for culinary purposes, this Beet is highly ornamental. It is, in my opinion, the best in flavour, colour, and form; and for garden embellishment surpasses every other kind of dark-foliaged plant. *Iresine Lindenii* and *Perilla nankinensis* are the nearest approach to the same shade, but not of such a bright conspicuous hue. It may be used in any arrangement in either bed or border. In ribbon borders I like to see it placed as a central line between yellow *Calceolarias* and the white *Centaurea ragusina*. Light-colour-foliaged *Geraniums* serve to give the same effect. Its cultivation is very simple; sometimes the seed is sown in the flower-bed in the form required, but this system is not convenient, as the seed must either be sown early, so that the young plants may be up and growing when the other plants are put out or sown at this time, when they are too late to be of any service in the forepart of the season. The best mode I have seen adopted, and the one which I prefer, is to sow the seed in the kitchen-garden in the Beet-beds about the beginning of April, and use the thinnings for transplanting in the flower-garden at bedding-out time, when they are a good size for immediate effect, and, if watered when planted, they do not suffer in the least from their change of position. These roots may be lifted and stored with the others for kitchen requirements during the winter. I have seen prize Beetroot selected from the flower-garden. Care should be taken that this Beet is obtained "true," or disappointment may follow.

J. MUIR.

CISSUS DAVIDIANA.

THIS is a native of China, whence its seeds were sent to the Paris Museum, by a missionary named David. It bears a violet-coloured



Cissus Davidiana.

non-edible fruit, is extremely hardy, and grows so vigorously as to spread over a large area in the course of a single year. It may be increased by means of cuttings, either taken when green in summer, or when ripe, and placed under glass in winter. Q.

CALCEOLARIA CULTURE AND THE DISEASE.

THE *Calceolaria* disease has only troubled me once, and that was in the wet season of 1872, when we had about double the usual rainfall, viz., 60 inches. But, though I thought the wet had something to do with it, I especially blamed the treacherousness of the plants received, and I cannot get rid of the impression that the

disease—which has been so destructive lately in many places as to lead some to think we shall lose the *Calceolaria* altogether—may be, to a great extent, prevented by special treatment and careful planting. In the case above referred to, I am pretty sure that the disease was induced by careless planting. We were busy bedding out in different parts of the grounds about the end of May. One man was planting the back lines of a long ribbon border, and during my absence he had lifted about 200 *Calceolaria* plants (*aurea floribunda*) from the nursery bed without being sufficiently careful to secure good balls to the roots; and, to make things worse, he had laid them all down on the surface of the soil in the row before beginning to plant, thus exposing them to a bright sun, which no doubt injured the roots seriously. I was so vexed when I discovered what had been done, and felt so doubtful about the plants growing well, that I would have re-planted that part of the row with fresh plants if they could have been spared. The remaining portion of the row—about half—was, however, planted more carefully, the whole watered when finished, and the ground frequently stirred afterwards to prevent evaporation. As I expected, those carelessly planted hung fire for a time, and never made such plants as the others. About the end of July they began "going off" with the disease in the usual way, and by the end of August not a plant was left. With the exception, however, of a few plants here and there, but not sufficient to break the line of yellow, the disease was arrested at the very point where the careless planter was overtaken. It was a striking lesson, which showed how much disappointment may be caused by the carelessness of one individual in a single instance. Comment is unnecessary; but I have reason for thinking that the row of *Calceolarias* I have referred to, or rather its absence, was a source of disquiet to the planter for the rest of the season. In the flower garden proper there was no disease worth mentioning. We have not had the disease since. Last season (1874) it committed sad ravages, especially in the London parks; with us not a single plant was affected—at least, none were observed—though the rainfall from the 1st of May till the end of July was under 3 inches, and the beds were well watered only three or four times, our water supply being early reduced; yet so luxuriant was the growth that the plants had to be shorn off the walks and bed edges more than once. And now as to treatment. In the first place, I may say that our stock has not been changed for twelve years to my knowledge. Our flower-garden beds, which are shallow (about 1 foot deep), are never manured with any other manure than decayed stable litter, of which a good quantity is given annually, and the staple is a tolerably heavy loam. We propagate about the first week in November, selecting the young succulent shoots without flower-buds, which the *Calceolaria* always furnishes abundantly late in autumn. These are made and dibbled thickly in a bed of sand and soil in a cold frame, where they remain all the winter. Sometimes they are frozen hard in frosty weather, and when this is the case the straw and mats are never removed till the thaw comes. Such plants are perfectly safe in the dark while frozen, but they would damp off if soft. When we have such frosts, therefore, as we have had lately, I contrive to get them frozen early, and have them covered up. When the thaw comes they are thawed with water just above the freezing point, and the lights taken off altogether any fine day. At the end of March or beginning of April a bed of light rich soil, 6 inches deep, is prepared out-of-doors, the *Calceolarias* are lifted out of the frame in flakes, as they all strip in a mass, and, while one man singles them out rapidly, another plants them with his hand, about 8 inches apart, picks the flower-buds off, and waters them as he goes on. We often have frost after they are planted out; but, being hardy, they resist a few degrees without protection, and, when needful, we throw a little straw over them at night. From the time they are pricked out in this way till bedding-out time, they do not grow much, but they make unusually stocky little heads and healthy foliage, and quite a host of roots; and it is the getting away of these roots, with large balls attached, to the flower beds, that I reckon upon to give them a start and carry the plants through successfully. The balls are sometimes so large, that a half-worn spade is necessarily used in planting. No reduction of the balls is allowed on any pretext, and, as planting proceeds, another man follows up with a thick mulching of Mushroom dung or old hotbed manure, putting it on tidily close up to the necks of the plants, and not missing an inch of ground anywhere. It is of no use mulching by halves. When all is finished, the beds are deluged with water from a rose till the bed is soaked through and through; after this their progress is rapid, and if the soil is examined under the mulching after a month of dry weather, it will always be found sweet and moist, and the *Calceolaria* roots close to the surface. When *Calceolarias* will not succeed under this treatment, it is quite time to discard them; but I do not think it could fail anywhere. Much, very much, however, depends on

planting. All may be ruined at this stage; and it is worth while to superintend the planting personally. I have seen planting going on by unskilled hands in parks and other places where large quantities of plants have had to be put out in a hurried and careless manner that might well shock any gardener accustomed to see the work done after a proper method. There is less chance of plants turned out of pots suffering by careless planting than such things as Calceolarias, Verbenas, Lobelias, &c., of which large quantities are now forwarded in beds and planted out with balls. A careless planter, when he finds he has not made the hole deep enough, generally brings the plant down to the desired level by giving the ball a squeeze, which effectually destroys it, and wrenches the roots as well. It is remarkably seldom that we get a new hand who does not require watching at such an operation—even upon Cabbages. First of all, make the hole of ample size, set the ball of soil with the plant down steadily, and then simply fold the soil in about it, and level up. Squeezing and pressing the soil afterwards about the plant are worse than useless; the watering and rain will settle all properly, and there is no danger of the plant blowing away. It is not a tree that is being planted, but a plant of soft tissues, with tender roots, that break with the least tension. To sum all up as regards the Calceolaria:—Get the plants up hardily, lift with good balls, plant carefully, water once or twice thoroughly, and mulch thickly. CHEF.

Evening Primroses in Utah.—With the disappearance of late spring frosts, which frequently continue to the latter part of April, and occasionally as late as early May, the intense heat of the lengthening days, rarely obscured by clouds, or tempered by showers, brings forward a rapid development of vegetation. By the 1st of May orchards have mostly dropped their blossoms; the fruit of the Apricot and Almond are developing, and Strawberries beginning to ripen, giving to fields and gardens a summer aspect. In the open country an analogous feature is brought to view in the native vegetation. We then note the appearance of several species of *Oenothera*, conspicuous among which is a large yellow-flowered one, which, being undescribed, I take (says Dr. Parry in the "American Naturalist") pleasure in dedicating to my friend, Mr. Johnson, as *Oenothera Johnsonii*. Mr. Johnson, who has had this plant for many years in his garden, called my attention to the regularity and suddenness of its opening, from fifteen to twenty minutes after sunset. This opening process, as frequently observed by both of us, is accomplished by a shrinking downward of the valvular calyx, the accumulated tension at a certain point suddenly releasing the segments from below upwards, which, becoming reflexed, allows the closely-confined convolute corolla to unfold visibly, its petals expanding in about thirty seconds, to a horizontal position. Quite constantly, just at this time, a small bee, apparently on the watch, darts in and loads itself with the stringy, adhesive pollen, to be carried, probably, to another flower. Generally, soon after, another bee on the same quest lands on the same flower, and finding the pollen gone, travels quickly over the stigmatic arms and soon flies away. This process, frequently repeated, ensures cross-fertilisation. Other *Oenotheræ* include a large white-flowered variety of the polymorphous *O. albicaulis*; as a rarity we also meet with a very neat *O. primi veris*, Gray.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Tom Thumb Ageratum from Seed.—This very desirable bedding plant does not come true from seed. Many plants, raised here last year from seed, selected and saved by myself, were quite out of character, both as regards habit and size of flowers; it is, however, easily propagated from cuttings.—E. HOBDAY, *Ramsey Abbey*.

Acacia lophantha for the Flower Garden.—This is invaluable for dotting through large beds of Pelargoniums or Verbenas. Its graceful habit of growth and Fern-like foliage effectually relieve the glare (much too obtrusive in the present style of flower gardening) that belongs to such plants. It is best raised from seed, which, if sown now in strong heat, will make large plants for this season's bedding.—W. WILDSMITH, *Heckfield Gardens*.

A New Way with Bedding Geraniums.—Where these have been wintered in boxes, instead of potting them off, as is usually done, a good plan is to take a little tough sod and to wrap around the roots of each plant, and tie; plant out on a slight hotbed of leaves, in a pit or frame. Thus treated, they grow rapidly, and can be removed to their summer quarters without the least check, the balls of earth having been filled with roots.—W. O., *Fota*.

Double Yellow Primroses from Seed.—We have at last succeeded in raising a semi-double yellow Primrose (*P. acaulis*), which is destined to become the parent of many varieties. I have no doubt that it will seed, and that its seeds will produce double varieties. The double varieties already in cultivation do not seed, or do so very rarely. I always sow *Primula* seed as soon as it is ripe, and find that every good seed vegetates. Can anyone tell me what has become of the old double white Cowslip figured by Miller?—WM. ELLIOTT.

Variegated Ivies for Root-work.—These form excellent plants with which to cover old stumps of trees or root-work, as they enjoy the partial shade of taller plants in summer, and come out with striking effect in winter. The roots being confined to a small space keeps the variegation much more perfect than it is in the case of plants that have an unrestricted feeding ground. In fact, of all the forms of variegation with which I am acquainted, that of the Ivy is the least persistent, if the roots are not restricted.—J. GROOM.

TREES AND SHRUBS.

NOTES ON BIRCHES.

The genus *Betula*, or Birch tribe, comprises a large number of species, all of which, except one, are natives of the northern hemisphere; the exception is the *Betula antarctica*, an evergreen shrub indigenous to Tierra del Fuego. The Birch is capable of supporting a much greater degree of cold than any other tree. In the Old World its northern limit is 71° upon the west, and 63° upon the east coast; in America its northern limit is 64° upon the west, and 58° upon the east. In Germany, the highest elevation at which it is found is 5,200 feet above the level of the sea; in Sweden at 3,900 feet; and in Lapland at 1,722 feet. It is worthy of remark that this tree decreases in size, not only as it advances towards the north, but also as it proceeds southwards beyond the limits of its native region. It attains its highest perfection and greatest height in Germany and Southern Sweden. The Birch is not particular in its choice of soil or situation, and will grow almost equally well in sandy, rocky, dry, or damp soil. A rich damp loam, however, seems to meet its requirements best. The commonest and most useful species of this genus are *Betula alba*, or White Birch; *B. pendula*, or Weeping Birch; *B. nigra*, or Black Birch; *B. lenta*, or Cherry Birch; *B. nana*, or Marsh Birch; *B. pumila*, or Dwarf Birch; *B. utilis*, or Nepaulese Birch; and *B. papyracea*, or Paper Birch.

The Common Birch (*Betula alba*) is met with in all the countries of Europe; and in the north of this Continent, as well as in Northern Asia and America, it forms extensive forests. In Sweden, Norway, and Lapland, it springs up in places where Fir, Pine, and Beech forests have been destroyed by fire. The size and appearance of the Birch vary considerably, according to the nature of the locality in which it grows. Upon lofty mountains it becomes comparatively small and shrub-like, thriving best upon slopes and plains. Its usual height is from 40 to 50 feet, but it frequently attains 70 feet. The bark of young trees is of a reddish-brown hue, but, with increasing age, it whitens until it assumes a beautiful silvery colour; the larger branches also become white, but the small twigs always retain their original hue. The Birch throws off the outer layers of its bark annually, and thus it generally presents a smooth and shiny appearance. Upon very old trees, however, the bark is sometimes burst and rent in all directions. The branches are slender, and at their extremities divided into numerous small twigs and rods. The leaves are ovate, sharp-pointed, and doubly serrated; they are bright green in colour, and when young emit a strong balsamic odour. The leaves droop downwards, and give a peculiar appearance to the tree, by which it can readily be distinguished from its forest companions. The flowers form catkins depending from the branches upon slender peduncles; the male catkins appear in autumn, but remain undeveloped throughout winter, and open only in spring. They bear upon each of the scales of which they are composed three quadripartite florets with four stamens. The female blossoms appear in spring; they bear upon each scale two naked germs, each of which has two thread-like styles. The seeds are ovate, and provided with two membranous wings. The ripe seeds fall in autumn, and are eagerly sought after by siskins. The timber of the Birch is white, close-grained, tough, light, and pliant. It makes excellent fire-wood, and yields superior charcoal for smelting purposes. The *sabots*, or coarse shoes worn by the peasantry in some parts of France, are made from the wood of the Birch; in Germany, spokes, ladder-beams, axe handles, and cattle-yokes are made from it; and in Great Britain it is used for turnery, hoops, and fish-barrels. Almost every part of the tree is utilised. Brooms and switches are made from the small twigs and rods. The young buds distilled in water yield a useful oil, which in taste and smell resembles balsam of copaiba. In Sweden and Norway the leaves are gathered green, and given to sheep and goats in place of fodder. Prepared with alum, they yield an excellent dye, which imparts a beautiful permanent yellow colour to linen and woollen materials. The outer bark of the tree is very tough, and almost imputrescible, and contains valuable balsamic and antiseptic qualities. In Sweden, Norway, and Finland the

bark is used instead of slates for roofing houses. Along the Volga and in some parts of North America canoes are constructed from the bark, and fishermen make their shoes of it. In Siberia and Lapland it is employed in the manufacture of boxes, baskets, hats, ropes, and drinking-vessels. In Russia, a bright reddish-brown oil is distilled from the bark of old trees; it is used in the preparation of Russian leather, to which it imparts a peculiar odour. In Poland the inner bark is highly esteemed by tanners. In America and Germany,

snuff-boxes are often made from the bark. When holes are bored in the trunk or branches in spring, before the leaves begin to expand, the sap readily flows out. This liquid is clear as water, and has a pleasant sweet, though somewhat acid, taste. Some trees yield a large quantity of sap, and as much as 10 lbs. of it may be obtained at once, especially if a bright sunny day follows upon a cold night. The sap contains a large amount of saccharine matter, and, when fresh, forms an agreeable beverage. In a fermented state it is known as Birch wine. In domestic medicine, certain preparations from the bark, leaves, and sap of the Birch are considered valuable remedies for ulcers, dropsy, intermittent fever, scurvy, and other diseases. The species of the Birch described above is extensively cultivated on account of its great value. It is propagated by seeds, layers, suckers, and cuttings. The seeds do not retain the power of germinating for more than one season. They should be sown in calm weather, upon moist soil, loosely dug, and covered with Moss. Sandy wastes

may be reclaimed by being planted with Birches; but, at the time of planting, it should always be remembered that such principal masses or trees as are to remain permanently must be arranged first, and their future size and character taken into consideration, so that the effect hereafter may not be left to chance.

The Weeping Birch (*Betula pendula*) is a very handsome tree; by many botanists it is regarded only as a mere variety of the common Birch. It is extensively planted as an orna-

mental tree in parks and pleasure-grounds, and thrives best in a damp soil. This tree is very common in the north of Sweden, where it forms a pleasing object in the landscape.

The Black Birch (*Betula nigra*) is a handsome well-branched tree, from 80 to 90 feet in height; it differs from the common Birch chiefly by its black bark. The leaves are lozenge-shaped, sharp-pointed, and doubly serrated; the petioles are long and hairy. This tree is a native of North America, from which it was introduced into England in 1736; it thrives well

in this country, even in the most barren and exposed situations. In taste, the bark of the Black Birch resembles senega. In America large quantities of sugar are obtained from the sap, but it is of inferior quality to Maple-sugar. There are two varieties of this tree known in England—*Betula nigra laciniata*, with split leaves, and *Betula nigra latifolia*, with broad leaves. The timber of these trees is hard, fine-grained, and of great value.

The Cherry Birch (*Betula lenta*) is also a native of America. It grows best in a rich, moist, light soil, in a free, open situation. Its usual height is 60 feet. The bark is black, and the leaves resemble those of the Cherry tree. The catkins are without peduncles, and consist of simple undivided scales. The bark and buds have an almond-like flavour, and the wood emits a fragrant odour. The sap is used in a similar manner to that of the common Birch. The Cherry Birch yields the timber known as "mountain Mahogany," and the volatile oil, called "oil of winter green," is derived from its bark.

The Marsh Birch (*Betula nana*) is indigenous to the

Alps of Lapland and the marshy lowlands of Sweden, Norway, Russia, Poland, and Switzerland; it is also the only tree found in Iceland. It is a mere shrub, and seldom exceeds 4 or 5 feet in height. The stem is creeping, and the branches are very numerous. The bark when young is reddish in colour, but when old it turns a bright silver hue. The roots consist of long red fibres, which spread widely in the ground; the leaves are small, almost oval, and deeply serrated. Like those of the White Birch, they yield a fine yellow dye. The catkins have no



The Birch.

peduncles, and are placed in the angles formed by the leaves with the twigs. The seeds are numerous, and form the favourite diet of the lemming and white partridge. In Sweden, the branches of this tree are much used by the peasantry as fire-wood; the dense smoke which they emit drives away the gnats, which at certain seasons of the year infest the houses and farm-yards of that country.

The Dwarf Birch (*Betula pumila*) is a native of North America, and was introduced into England, in 1762, by Mr. James Gordon. It seldom exceeds 7 feet in height. The leaves are twice as large as those of the Marsh Birch, ovate, deeply serrated, and lanate upon both sides. The branches are covered to the extremities with a fine woolly substance. The roots are long, red, and strong, and their wood is of considerable value for inlaying work.

The Nepalese Birch (*Betula utilis*) is a native of Northern India; its bark is used in India as packing material, and for lining the tubes of hookahs.

The Paper Birch (*Betula papyracea*) is a native of North America, in the northern parts of which it forms extensive forests. Its bark is exceedingly tough, and is used by the Indians for paper, packing material, tents, canvas, and baskets.

Like all other forest trees, the Birch has its enemies and inhabitants; these are chiefly insects of which the following are the principal:—*Tachyptera antiopa*, *Geometra betularia*, *Tinea proximella*, *Hesperia betulæ*, and *Tortrix solandria*. *Bombyx betulæfolia* is not a denizen of this tree, but has received its name merely from the resemblance that its wings bear to the leaf of the Birch.

JOHN HUTCHINSON, M.A.

NEW EARLY-FLOWERING TREES AND SHRUBS.

THE following ornamental varieties of the class usually known as fruit trees are now showing most abundant promise of blossom with me, some of them for the first time. Of the latter I shall have something to say hereafter; but in the meantime some short account of some of the varieties already known to me may not, I hope, prove unwelcome to your readers, as I think that if these beautiful and free-flowering shrubs were better known than they now seem to be, even in the best English nursery gardens, they would be much more extensively cultivated than they at present are. Nearly all the varieties which I grow I received from Belgium. First I would notice *Malus florabunda*, so beautifully figured in the fifteenth volume of Van Houtte's "*Flore des Serres*" by a series of one single and two double plates, the first giving a branchlet in full flower of the natural size, and most faithfully coloured; the first double plate represents the whole tree covered with rosy buds just about to burst, and the second double plate the whole tree covered from top to bottom with its wreaths of rose-coloured blossoms. This, when seen in full perfection, is as beautiful as anything of the kind I have ever seen or heard of in this country. Of this *Malus* there seem to me to be two varieties, as, when first I received it from Ghent about four or five years ago, I got two plants nominally the same, but which proved, as they grew and developed their characteristics, to be quite different—at all events, in habit of growth—as the one grew straight upwards, and is now some 12 or 14 feet high, while the other spread laterally with a decided tendency to weep, and is now not more than 4 feet high, but three times that measurement in circumference. This last has flowered profusely each spring for the past three years, but the upright-growing variety did not flower at all for the first three years; last year it produced a stray bunch or two of bloom, but this year I am happy to see every young shoot furnished with its bunch of bloom, just as in the other and more weeping variety. Next I would mention *Malus baccata flore roseo pleno*, beautifully figured in a double plate at the end of the nineteenth volume of Van Houtte's "*Flore des Serres*." This is the earliest to open its blossoms of any variety with which I am acquainted, and is extremely free-blooming and a very fine plant. Another beautiful and tolerably free-blooming plant is the *Cerasus caproniana ranunculiflora*, a shrub which produces large double pure white flowers, and is by far the finest double Cherry which I have as yet seen; it is figured in the seventeenth volume of Van Houtte's work (p. 159). Two other fine Cherries are *Cerasus Watererii*, white-edged, with pale rose colour, and *Cerasus Sieboldii flore roseo pleno*, a large blush-coloured semi-double flower. Some four years ago I received also from Ghent a plant under the name of *Prunus virgata*, which, up to this season, has done nothing but grow, sending up, principally from the root, numerous slight switchy shoots, but never showing any sign of blooming, which was the more disappointing, as it was described to me as a beautiful double rose-

coloured variety. This spring I am pleased to notice on the extreme points of some of the young growths of last season one or two full and double-looking buds, somewhat resembling those of the lovely *Prunus triloba* (which, with me, is unfortunately an extremely shy bloomer), but deeper in colour. It is to be hoped when these expand they will be as beautiful as they have been said to be. Another curious Japanese variety of *Prunus* is that described and figured in Siebold and Zuccarini's "*Flora Japonica*," under the name of *Prunus tomentosa*. This variety is chiefly valuable, not for the beauty of its blossoms, which, though profusely produced, are dull blush in colour and insignificant in size; but, for its beautifully bright scarlet fruit, which resembles a large and shining haw or *Cotoneaster* berry in size and appearance, with a white spot in the centre of each side. I cannot, however, get it to set its fruit satisfactorily, having only succeeded in getting one or two fruits during the three years I have had it, although I have tried it both in a pot in the house and in the open air, where it now is, and also endeavoured to artificially fertilise the blossoms of which the plant each year produces a large quantity. The other varieties I expect to bloom this season, for the first time, are named respectively as follows:—*Malus spectabilis flore albo pleno*, double white Apple; *M. sibirica coccinea*, *M. toringio major*, *M. tenori flore carneo pleno*, and *Cerasus umbraculifera*, a dwarf bush-growing variety. As I see that Mr. Van Houtte, in his last Catalogue, No. 158—F. F., page 93, offers good plants of the lovely *Malus florabunda* at the very moderate price of 10d. each, or 6s. 6d. a dozen, no one fond of flowering shrubs need or indeed should be any longer without this beautiful plant.

W. E. GUMBLETON.

Belgrove, Queenstown, County Cork.

Gum Copal Trees.—A short report from Zanzibar, by Captain Elton, on the Gum Copal trees of Dar-es-Salam, has just been printed among the Parliamentary papers. Captain Elton was astonished at the number and size of these trees, which far exceeded anything he had before imagined. On stripping off the bark, the gum was found deposited in many places between it and the wood in a liquid form. The trees are suffering from the attacks of swarms of ants and other insects, and are being slowly but surely destroyed. They are all festooned with the long intertwined ropes of the india-rubber Uiana, the thickly-matted cords of which, pendent from the main limbs and knotted into a sort of rigging, become an easy means of ascent to the natives looking for the resinous deposits on the branches. This india-rubber was worked rather extensively here at one time, but was soon given up as unprofitable, in consequence of the number of slave-lads carried off by leopards.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The White Pine as a Hedge Plant.—This is used in New England for this purpose, and on account of its brighter and never changing green it has a finer appearance than either the Hemlock Spruce or American *Arbor-vitæ*. For dry sandy soil it is peculiarly adapted.

Walnut Burls.—A burl is a disease—an excrescence which grows out from the trunk of a Walnut tree, and which is often found of an enormous size, sometimes a ton in weight. The choicest ones contain a beautiful and variegated grain, and they have been known to command high prices.

Should Seeds of Styrax be Soaked or Cracked.—I have this day received from the Continent the seeds of a new *Styrax* from the mountains of California, and as the shells of the seeds (which are most of them larger than a full-sized Pea) seem extremely hard, I shall be glad to know from some of your readers, who have experience in these matters, what is the best course to adopt to ensure vegetation—whether the seeds should be soaked in water, or whether the hard shells should be broken and only the kernels sown.—W. E. G.

Tree Nurseries of the World.—The Romans were the first of original propagators and disseminators. To them France and England are indebted for the first introduction of choice varieties of fruits, and to the missionaries of the Romish Church is largely due the introduction of choice varieties everywhere. France probably has grown and distributed from her commercial nurseries more trees than any other nation, and to-day she is supposed to have 200,000 acres in such nurseries. There is no estimate of the actual extent of German nursery gardens at hand. The United States commenced commercial nurseries about 1791, and from 1810 to 1820 had perhaps 200 acres. According to "*Moore's Rural New Yorker*," it may now be estimated that 500,000 acres are devoted to commercial tree growing in the United States.

Eucalyptus globulus in the Riviera.—I was glad to see this noble Australian tree flowering so abundantly in the Riviera during January of the present year. I saw it in flower at San Remo, Nice, Cannes, and Hieres. It appears perfectly acclimatised, attaining to the height of 30 to 40 feet, and covered thus early in the year with its beautiful blossoms. Belonging, as it does, to the Myrtaceæ, it has much of the perfume of this group, and its fine scimitar-like pendent leaves exhale a rich resinous aroma, which is considered as a counteractant of the malaria so prevalent in the marshy tracts of Italy, being abundantly planted about Rome to effect this very purpose; and, as it readily adapts itself to the soil and climate, it may prove a valuable antiseptic. The inflorescence, as in so many of the Myrtlewoods, consists of a crown of stamens covered before expansion by a closely-fitting white lid of a globular form. We thus see the appropriateness of both the generic and specific name as applied to this tree.—PETER INCHBALD, *The Lodge, Hovingham, York.*

SURFACE DRESSINGS.

THESE are generally given to enrich impoverished soil, and barren fruit trees are often brought into fertility by means of them. When the roots are down in an uncongenial sub-soil top-dressings will not bring them to the surface, but they will induce the formation of young fibres there, and thus improve the state of the tree compared with what it was when its sustenance was wholly derived from the tap roots. Top-dressings should always be placed in contact with some of the roots; for, unless this is effected, they are almost useless. Roots have a tendency to go down and embed themselves in the richest soil, but I have never found any of them pushing up towards a rich top-dressing, that is, if they had to pass through a stratum of matter which they disliked. It is not an uncommon thing, when turning out plants from pots which have been top-dressed some time previously, to find the top-dressing fall clean away from the entire ball. This is the result of not incorporating it thoroughly with the old soil, and of not putting the mixture well round the roots. The result is the same in the case of fruit trees, and in all other instances in which top-dressing is not done properly. Of course, in these cases, when the material used is very rich, much of the fertilising principle is washed down amongst the bottom roots, but the advantages which attend a free and copious surface rooting are lost. I know instances in which Vine borders, both inside and out, are heavily top-dressed every autumn with rich materials, and yet not a root is to be seen when they are annually turned up. Vines in such a condition might be much improved by having the main portion of their roots brought within a few inches of the surface, but of this they have very little chance until fresh top-dressings are placed directly in contact with them. Many plants are grown one year in pots, from which they cannot be removed the next. Vines, potted and grown on in their fruiting pots this season must be kept in the same pots next year until they fruit. A quantity of loose exhausted soil is generally found on the surface at the end of the season, and this should not be permitted to remain. On the contrary, it should be removed, and a top-dressing put in its place, and in a position where the roots can take possession of, and utilise it when it is most needed. The removal of a few leaves from the neck of a Pine-apple plant, shortly before the fruit appears, and the application of a good top-dressing always does good—the roots run freely into it, and it is ultimately of great assistance in finishing off the fruit. Melons and Cucumbers are much benefited by top-dressing. When the latter have produced their first crop, a second, quite equal to the first, may be obtained by adding a good top-dressing to the old plants, an application which renews their vigour, and gives them a further lease of fruitful life. Probably no plant will recognise and repay a top-dressing better than an old exhausted Peach or Nectarine tree. I have seen old trees of these kinds, scarcely capable of bearing a single fruit in midsummer, induced not only to bear heavily at that season, but come in as early croppers in May through the aid of a rich top-dressing. It has the same salutary effect on all fruit-bearing trees, whether they are confined to the inside of a house or exposed on open walls. Such trees, however, should not be top-dressed every year, as that would too much disturb their roots, which should be near the surface. Flowering plants in pots are equally benefited by top-dressing. Large plants of Camellias, firmly rooted into pots or tubs, and whose life would be endangered by a complete shift, may, by a suitable surfacing, have years of vigorous life and usefulness added to their career, which would otherwise be passed in drooping decline, and Azaleas may be benefited in the same way. Small quick-growing plants are seldom top-dressed; they generally can be conveniently re-potted, when no surfacing is needed. With cottagers and amateurs, the re-potting of their window-plants is often considered to be a dangerous operation, and many of these plants are, for this reason, allowed to dwindle for years in the same soil and pot. Those who are afraid to re-pot annually, should substitute a thorough top-dressing; and if the drainage below be efficient they will soon be repaid for their trouble. There are not a great many vegetables that need top-dressing at any time. Earthing-up may be considered as a form of top-dressing; it induces multiplication and surface-rooting in many plants.

Herb roots are not generally re-planted every year, and their productiveness is greatly enhanced by an annual spring top-dressing. This saves mulching, and I infinitely prefer the former to the latter; for, when a plant, with its roots close to the surface, is mulched, the roots grow freely under it, but their growth is not substantial, and they generally die back as soon as the covering is taken away, and are not at all of the same healthy character as those grown in, and protected by, a suitable top-dressing. I have stated that top-dressing may be accomplished at any time, which it certainly may without injury; but I prefer applying it in most cases before growth is far advanced, in order that it may be made available to assist development.

J. MUIR.

ROAD MAKING.

IN the construction of ordinary highways, the civil engineer, geologically speaking, has before him three things of prime importance—choice of route, nature of gradients as requiring excavation and embankment, and suitability of material for bottoming and macadamising. In Britain, where many of the roads are of ancient date, and were originally intended for pack-horses and not for carriages, they are generally “up hill and down dale” over dry tracts, and very unsuitable for modern requirements. When such roads have to be improved in their gradients, it is usually by a series of “cuttings” and “embankments;” and some skill is required not only in excavating the rock-material, but in seeing how far the whole or any portion of it can be utilised, either in the construction of the road and the embankments, or as an article of sale in the neighbourhood—be it sandstone, limestone, greenstone, or granite. But where a new route of easy gradients has to be chosen, the engineer, from his geological knowledge of the district, may often show great skill in avoiding expensive cuttings; in making cuttings, which, though expensive, may more than repay themselves by the utilisation of the excavated rocks; and in keeping clear of peaty and marshy hollows for his embankments, which are never stable till the soft boggy sludge is squeezed out, as it were, by three or four times the amount of carried material that would have been required on a firmer bottom. In choosing a new route, shortness, easy gradients, and the requirements of the district are, no doubt, prime considerations; but in some instances it may be worth while to deviate from the selected track in order to come in closer proximity to quarries, clay-pits, and coal-fields—the increased traffic arising from which may become a source of income for the permanent maintenance of the highway. Highways are the arteries of a country’s commerce, and a good system of roads suitable for all requirements, present and prospective, is one of the most essential elements of national prosperity and development.

Road Cuttings.

Having selected a route, the engineer has next to enquire what excavations, what embankments, and what bridges will be necessary to render the road of easy traction as to gradients. In the matter of excavation, it requires some skill, according as the cutting may be through tough boulder-clay—through an admixture of drift sands and clays, which are apt to slip by the percolation of water—through greenstones and basalts, which, though expensive to remove, may be utilised as road-material—or through sandstones and limestones, which may be applied to the erection of bridges and retaining walls. Some acquaintance with the structure of rocks will also be of use to the engineer, in as far as these may be jointed or full of “backs and cutters,” like some limestones; columnar or sub-columnar, like basalts and greenstones; tabular, as granites; or in alternate hard and soft strata, as sandstones and shales. Every formation has its own lie and structure, and excavating in accordance with these is always the cheapest and most expeditious method. Where the material is of uniform character, little care is needed either as regards retaining walls or slope of excavation; but where the material is of unequal durability, as alternations of sands and clays, of sandstones, shales, and clays, the weathering of the softer beds is sure to ensue, and should be protected by facing-up immediately after excavation. From want of this precaution—and especially in railway cuttings—much after-expense has often been entailed, and that not till obstructions and accidents have happened through slips and falls—such contingencies of themselves costing ten times the amount of any walling-up that might have been at first adopted. Some care is also necessary when excavations pass through strata at high angles, so as to prevent slips from the rising side; and when water-bearing beds occur, free egress must be made for the outflow, which otherwise would, in process of time, bring down the strongest retaining wall. Where cuttings pass through rocks suitable for building or for roads, a free face should be kept, if possible, for

future quarrying—the situation being so available, not only for the working, but for the removal of the quarried material. A quarry in close proximity to a road or railway is always more valuable (other things being equal) than one situated at a distance, the expense of cartage, loading, and unloading adding considerably to the price of the raised materials. We have spoken of road-routes as they usually occur in the British Islands; but in mountainous countries a great deal of extra skill and precaution has to be exercised in winding and zigzagging, in scarping or tunnelling precipices, and in providing ample and substantial water-courses and culverts—the heavy rainfalls of these heights, and their steep inclinations, subjecting the highways to torrential forces altogether unknown in lowland regions.

Embankments and Bridges.

In the matter of embankments, little geological knowledge is required beyond ascertaining the nature of the foundations on which they are to rest, the facility with which the banking material may be obtained, and the angle of repose at which such material is likely to remain. Embankments across marshes and peat-mosses are frequently of difficult execution, requiring not only a vast amount of material, but sometimes subsiding for months and years till the soft underlying bed be thoroughly squeezed out or compressed. Besides calculating so that excavation and embankment shall balance each other as nearly as possible, the side-slopes or angle of repose should be studied, blocks and hard rocky debris resting at inclinations at which sand, clay, and soft earthy substances could not possibly remain. Embankments are artificial rock-formations, and the more uniformly the material can be “tipped” and assorted, the more compact, impervious to water, and less liable to “sits” and slips, will the mound become. As with embankments so with bridges; their foundations require similar attention, and though their construction be chiefly a matter of masonry, yet some geological acquaintance with the situation and nature of the materials to be employed cannot fail to be of advantage. Whatever the nature of the bridge, whether stone or girder, everything depends upon a secure foundation; and this, again, depends on the geological nature of the material to be built upon, be it solid rock, tough firm clay, or soft silts requiring concrete, piles, or other device to secure stability. The alluvia in river-valleys are often of great depth and of treacherous nature; and it is frequently more judicious to make a deviation to secure a rocky foundation than to persevere in a straight line over such superficial accumulations.

Road Materials.

Touchning road materials, a great variety of substances are used in Britain, but the best of them will not make a smooth and durable highway unless they be laid on a good bottoming of rubble-stones, and these again on a well-drained surface. On a wet soil the road-metal sinks, becomes uneven, and wears irregularly, while in winter the moisture freezes and expands, and when thaw comes the surface is broken up and the consistency of the metal destroyed. In all cases the scarf-skin of agricultural soil should be removed, and, if not needed for levelling-up, can be readily disposed of on the adjacent farms for composts and admixture. In some districts where granites abound they are broken for road metal, but if large-grained and highly felspathic they are easily crushed and reduced to clay. In others porphyries and felstones are employed, and many of these, from their hardness and toughness, stand well, though somewhat expensive in the breaking. In others, again, where traps prevail, greenstones and basalts are largely used, and when broken to proper size make by far the smoothest and most durable roadway. Of course there is great variety among these greenstones, but unless among the softer and more felspathic sorts, they are not only durable but cheaply procured. In some districts the harder pebbles (chiefly of quartz, porphyry, granite, &c.) from river-channels and the sea-shore are employed, in others the harder and more silicious limestones and sandstone; in some the flints from the chalk, and in others near blast-furnaces the slag is broken by crushing machines, and makes a fair, though not very durable, metal. In all cases of macadamising, thorough drainage and a good bottoming of rough rubble is indispensable; and when the metal is laid on, a heavy rolling down and consolidation with some sharp gravelly binding is equally necessary. Basalts, greenstone, felstones, and felstone-porphyrries, make the smoothest and most durable metal, and now, since the introduction of efficient crushing-machines, should be sought after by the road-maker, even though requiring to be brought from considerable distances. In the construction of street thoroughfares subjected to heavy and continuous traffic, and where macadamising would be all mud in winter and dust in summer, recourse must be had to causewaying either in rubble or in regular courses. The former may do for by-streets where the traffic is light; but for the great public thoroughfares of a commercial town nothing will serve save coursed blocks of granite, porphyry, or greenstones. Wooden blocks, concrete, and

asphalte are at their best but indifferent substitutes, and wholly unsuited where the gradients are steep or even considerable. Granites like those of Aberdeen, Argyle, Dalbeattie, Creetown, Wicklow, the Channel Islands, &c., are largely used in all the thoroughfares of our principal cities, and make clean and durable streets; but some kinds of porphyry, like that from the Moorfoot Hills, and employed in Edinburgh, are harder and tougher, though from their tendency to wear smooth they require to be laid down in narrower courses. Greenstones are also largely used, and when properly coursed and bedded are almost as durable as granite. Good samples of greenstone-causewaying may be seen in Edinburgh (Ratho, Dalmahoy Crags, and Corstophine Hills), in Glasgow (Croy and Kilpatrick Hills), in Newcastle (Christon Bank and Wall), in Leeds (Richmond), and, indeed, in most of our large towns where the rock can be obtained at a cheaper rate than granite. In some instances quartzites and hard silicious sandstones are employed: they stand well, but, from their tendency to wear smooth and slippery, require to be laid, like the Moorfoot porphyry, in narrow courses. For the footpaths of our towns flagstones are in great request, and some of them held in high estimation. Those from the lower old red sandstone of Caithness are extremely hard and durable, and can be obtained of great size, and from 1 to 9 or 10 inches in thickness. Being very hard and close in texture they are apt to become too smooth; some contain nodules of iron sulphide which resist wear, and render the surface irregular and somewhat dangerous, and many of the harder and thinner sorts are apt to crack unless carefully bedded, as all of them require to be. They are, however, impervious, or nearly so, to water, and make a clean and easily-kept footpath. About 10,000 tons are annually exported from the county, at a value of between £4,000 and £5,000. Those procured from the lower old red of Forfarshire and Perthshire enjoy also a high reputation; but from their softer, more laminated, and absorbent nature, are better fitted for inside than for outside pavements. Local supplies of flagstones are also obtained from the coal formation in several counties (Fife, Edinburgh, and Lanark); but those from the millstone grit and Gannister beds of Yorkshire and Derbyshire are perhaps the best and most durable, and capable of being raised of great size and of any thickness. Supplies are also obtained from the new red sandstone of Dumfriesshire and Cumberland, which are of fine even grain, and though rather soft, wear well and equably. Flags of fair quality are also raised from the middle oolite, and from the Wealden in Sussex, but they want the largeness, smoothness of surface, and compactness of texture which characterise those from the old and new red sandstones. What is wanted in a good flagstone is variety in thickness and size, a straight and even surface or bedding, and a non-absorbent and compact texture—laminated varieties being apt to split or peel off under the influence of frost and moisture. In some country towns the footpaths are neatly laid with pebble-stones; and in the suburbs of Edinburgh the larger chips obtained in dressing the causeway-blocks are closely set on edge and beaten down to a smooth surface, thereby making a firm and durable material under the name of “Hornising,” after a surveyor of the name of Horne. For kerb-stones, granite, greenstone, and some of the harder sandstones and limestones, have long been used. The granites of Aberdeen, Kirkcudbright, Wigtown, and Wicklow, make excellent material; some of the hornblendic greenstones, as those of Queensferry on the Forth, and of Corstophine and Ratho near Edinburgh, are equally suitable, and more cheaply tooled; while many of the harder limestones (Derby, York, Westmoreland, and Devon) square well, and are extensively employed in their respective areas. In some towns sandstones on edge are employed; but these, unless hard and uniform in texture, are apt to split up under the weather, and wear irregularly. A straight, durable, and well-set kerbstone is indispensable to a good street, not only in retaining the flagstones and maintaining the gutters, but in imparting an appearance of finish and stability to all the lines and turnings.—“Economic Geology.”

Ice for Preserving Fruit.—The introduction of modern fruit-preserving houses, wherein, by means of ice, a low temperature is maintained at all seasons, is of real benefit to horticulture. The Nice patent appears to have been the first really practical application of the system, and so far as we understand its utility, is very deficient, not alone in construction, but in the material requisite to keep the atmosphere dry and pure. A very simple arrangement of this character is in use at Reading, where the fruit is preserved for a year, coming out as fresh as when first put in. Others at various points in New York State are also in good working order, and from present appearances will prove successful. The chief requisites in this system of preserving vegetables and fruits are a low temperature, thorough ventilation, and moderate cost.—“New York Tribune.”

THE NEW ZEALAND FLAX IN IRELAND.

PEOPLE about London have no idea of the great value of the New Zealand Flax as an outdoor ornament. In London we value it highly for the conservatory or winter garden, or for room decoration; but, however well grown it may be in pots or tubs, we never get from these a good idea of the fine aspect of the plant when well-grown in the open air and in a favourable climate. In the south and west of England this Flax is frequently hardy out-of-doors, but the finest plants we have seen are in Ireland, where it thrives remarkably. Last autumn, in Lord Meath's garden at Killruddery, Wicklow, we saw the fine plant of which the accompanying is an illustration. It occurs in the kitchen garden there, and our engraver has taken the liberty of associating it with less prosaic surroundings. Remarkable as the specimen appears to be, judging from the illustration, it is more so in reality. Mr. Turner, writing to us from Killruddery, states that the plant is 12 feet high and 48 feet in circumference, one leaf measuring 14 feet in length. In New Zealand this plant may be seen

the best prepared Flax, which they scrape with sharp shells or knives, and, although only a comparatively small quantity can be thus rendered fit for the European market, it nevertheless invariably brings the highest prices. Many mills, however, are still worked, and no inconsiderable quantity of the Flax reaches England annually, in spite of the difficulty which has been alluded to, and the removal of which would render the Flax an article of export second only in value to the wool of the colony.

ORNAMENTAL PLANTS.*

ONE great drawback to the extended distribution of many highly ornamental plants is the difficulty of adequately describing their peculiar beauty. One cannot possibly form a fair opinion of their merits from any verbal account, however concise and correct it may be. On the other hand, illustrations, more especially those that are coloured, at once enable us to form a just conception of the shape, colour, and general appearance of any plant that may thus be figured. The publication we are now noticing, which is the joint



New Zealand Flax at Killruddery, co. Wicklow.

covering acres of ground throughout the three islands, over which it is, in places, plentifully distributed. It appears to grow most profusely in damp alluvial ground—often upon the banks of rivers and rivulets, and sometimes at very considerable altitudes. The Maoris were, and indeed still are, in the habit of obtaining from the leaves a most valuable fibre, which, when thoroughly freed by hand-scraping from the resinous gum which surrounds it, is of a soft silky appearance and texture, and of unusual strength. Numberless attempts have also been made by colonists to discover some method of cleaning this Flax, and a great many skutching mills have been erected at various times, both in the north and middle islands, with this object. At one time it was considered that the secret had been discovered in the use of ammonia, but, either from the expensive nature of this chemical when used on a large scale, or from its practical failure to accomplish any valuable results, the process was never universally adopted. The natives, even now, produce

work of MM. Cogniaux and Elie Marchal, and edited by M. Alexis Dallièrè, is, for this reason, a valuable addition to botanical and horticultural literature, inasmuch as it contains between fifty and sixty unusually large plates—the majority of them beautifully coloured—of many plants which have never been correctly represented before, besides those of which illustrations are somewhat more common. In addition to this each plate is accompanied by excellent botanical, historical, and horticultural descriptions, which render the work a very complete one.

Frosty Weather and Lake Subsidence.—When a sharp frost sets in in the Lake district the level of the water in the larger lakes quickly falls as in a dry summer. So noticeable is this, that the boatmen and fishermen say, “the frost nips the water off the lake.” The real reasons are, I believe, obvious. In frosty weather the rainfall ceases, the drainage and the rivulets (the

* “Les Plantes Ornementales à Feuillage Panaché et Coloré.” Edité par Alexis Dallièrè, et rédigé par Alfred Cogniaux et Elie Marchal.

feeders of the rivers) on the mountains are very quickly frozen up, the outflow from the lake all the time going on freely unimpeded by the frost, because the volume of the stream is large, and much nearer the sea-level.—“Science Gossip.”

GARDENING FOR THE WEEK.

Indoor Fruit Department.

Vines.—When all the soil for planting these has been mixed up, as directed last week, the formation of the border may be proceeded with. Drainage must form the lowest layer, and for this nothing less than 6 inches of roughly broken bricks or stones is sufficient; if the bottom beneath the drainage is soft, a thin layer of concrete to begin with is an advantage. In a lean-to building the bottom should be made to slope from the back to the extreme front; where span-roofed it should drop both ways from the centre. A large main drain should be laid along the margin of the slope, so as to convey away superfluous water at once; small 4-inch tiles, running across the border horizontally into the main drain, is a sure means of drainage. A few of the roughest turves should be placed, grassy side down, over the entire drainage. The soil may then be filled in, mixing the rough with the fine throughout; 2½ feet is a very serviceable depth for the soil, but, being new, round, and fresh it generally settles down from 4 to 6 inches from its original height, so that the soil should be 3 feet deep all over the border when first made up. Grapes on the earliest pot Vines will soon be changing colour, and no opportunity must be lost to admit a circulation of fresh dry air after this has begun, for, when ripened in a close atmosphere, they are generally deficient in flavour. Manure-water should not be given to Grapes colouring, but clean water must be regularly supplied when needed. Vine eyes will now be pushing freely, and a dewing overhead every afternoon assists the leaf-expansion; 5° more bottom-heat may be given as soon as a few roots are formed.

Pines.—The temperature for newly-potted plants should be about 70° at night and 85° during the day before admitting air, which should be with the top ventilators for a time. Humidity must be copiously kept up night and day, or the leaves will shrivel before roots are formed to prevent it; and a syringing overhead occasionally is of much benefit to them. Successional Smooths, and other sorts, intended to succeed the Queens as fruiterers, should be re-plunged after those newly potted are finished with. If they have been growing closely together previously, they should be plunged wide enough to admit of their unrestricted development. The glass and wood-work must be washed, and the walls lime-washed, as the plants are taken out, and before they are re-plunged; such operations cannot be easily performed afterwards. Do not let Queens, now rapidly swelling their fruit, suffer through want of water. In a general way, once a week is not too often to water them; but, if necessary, it may be given twice during that time, or withheld altogether.—J. MUIR.

Peaches.—The thinning of the fruit in the early house should be attended to as soon as it can be seen which fruits are taking the lead in size, and this can be observed when they have well burst the tube of the faded flowers. It is wasting the energies of the trees to allow the fruit to become as large as Peas before thinning, which, if done vigorously, will give the fruits left a better chance of swelling and stoning, and will induce them to grow quicker and larger than if a quantity, which must eventually come off, were left to compete with them at this early stage. Another good watering should be given to those planted in inside borders, as Peach trees in full leaf can scarcely have too much water at this period, provided it be certain that there is free drainage underneath. Proceed also with the disbudding of the trees, gradually removing the shoots which are badly placed, and thinning out those on the underside of the branches first; and where the young shoots are generally overcrowded at the base of the bearing wood. I recommend a system of pinching as well as thinning, that is, disbudding where overcrowded, and pinching in the shoots wherever there is room for them, always training in young wood in the usual way. Where the branches have been left too thick at the winter pruning, the present is a good time to remove some of them, in order to give room for young wood for another year, as choice can now be made of those branches which are least fertile. Overcrowding is sure to end in weak growth, and ultimately in badly-ripened wood. During dull weather a little fire-heat must be maintained in succession houses to cause a free circulation of air about the blossoms. A damp, cold atmosphere is the very worst condition for setting the fruit. Moisture may be given, and the syringe may be used even freely, provided there be a warm, brisk atmosphere maintained. The blossom buds are now swelling fast

in cool unheated houses, and the borders must be thoroughly moistened throughout. The trees will open their blossoms quicker when the borders are dry, because the soil is warmer, but the fruit will not set so freely. A border thoroughly wetted now will have the effect of retarding the blossom, but also of causing a more healthy setting of the fruit. Checking the bloom at this season will eventually be found a decided gain. Give air to such houses early in the day to dry and thoroughly ventilate the interior, shutting up early in the afternoon to husband sun-heat.

Melons.—Recent dull weather has been unfavourable to the healthy progress of early Melons; without a brisk bottom-heat of 80° their development will be slow, but, to give much fire heat in the absence of sun, causes watery growth, and is a doubtful practice. It is preferable to husband the strength of the plants until the return of bright weather. Although all the light possible is necessary at this season to strengthen the growth, they will, on sudden outbursts of sunshine at midday, require a little shade to prevent scorching, to which Melons are liable at this season after dull weather. The sun must, however, be allowed to strike on the soil as much as possible; this can always be managed by using small separate screens for each plant instead of those covering the whole house or pit. As the plants advance they will require to be pinched to cause them to throw out lateral and fruitful growth, but this will not be necessary until they have gained 2 or 3 feet up the wires, for these remarks apply to Melons grown in heated houses with wires strained close to the glass.—W. D. C.

Flower Garden and Pleasure Grounds.

Pot off singly the rooted cuttings of bedding Pelargoniums of all kinds in order to have strong well-furnished plants for turning into the flower beds at the proper season. Keep the plants, for some time after they have been potted, in a warm close atmosphere until they become somewhat established and their roots reach to the sides of the pots, when they may be transferred to frames or cold pits, and their place taken by other newly-potted plants. In most gardens every inch of room under glass will now be required; and, to economise space as much as possible, such half-hardy species as the various bedding Calceolarias, and similar plants, which may have been inserted as cuttings during the months of September and October, and which may have been wintered in store pots, in pits or frames, and will now be well rooted, may be shaken out of the pots and pricked out into beds of light rich soil in frames, turf pits, or even into a prepared trench, so that they can have, when necessary, the protection of mats or other materials. From this the plants can be readily transferred to the flower beds, early in May, with little or no check. Plants treated in this manner generally succeed better than if turned out of small pots. Verbenas, Gazanias, and other species of bedding plants may now be subjected to this treatment with much success. Where succulent plants are likely to be extensively used as edging plants to flower beds and for forming divisional lines in carpet bedding, such species as the *Echeveria secunda glauca*, *Sempervivum californicum*, &c., which may have been wintered in tufts or patches, should now be divided and pricked out singly in pans or boxes. A few seeds of the Ten Week and German Stock may now be sown in a gentle heat for early flowering, together with a few climbing and other annuals, for special purposes, such as the *Cobæa scandens*, *Lithospermum*, *Maurandias*, &c; and, if not already done, no time should be lost in sowing, in pans, the blue *Lobelia* and the Golden Feather *Pyrethrum*; while its rival, the *Stellaria graminea aurea*, should be increased by cuttings or divisions. Most hardy herbaceous plants will now be showing themselves above ground, and the soil should be enriched if necessary with some manure, or fresh soil may be added to it, and carefully forked or dug in. A well-arranged herbaceous border ought to be an indispensable feature in every garden, affording, as it ought, a succession of flowers from early spring-time until nearly the end of the year; and, as the present is a very favourable time for introducing fresh and valuable varieties into this department, the claims of many of the new Phloxes, Delphiniums, Dianthus, Lilliums, &c., are well worthy of consideration. The presence of broad-leaved weeds, such as the Plantain, very frequently detracts greatly from the otherwise pleasing appearance of lawns, Grass belts, &c., and there is now a good opportunity for extracting them. This is easily accomplished by thrusting a sharp knife under the plant, so as to sever the roots an inch or more below the surface of the ground, when the plants may be drawn out without disturbing the soil in the least degree; and if a pinch of salt be then dropped into the hole, the destruction of the intruding plant may be considered as completed. The lawn should afterwards be swept and well-rolled. As before, long mowing may be found to be necessary, and it is generally considered advisable to pass the scythe at least once over lawns, &c., before the mowing machine is brought into action.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Forcing Roses.

The absence of bright weather affects the successful forcing of the Rose equally, if not more, than that of any plant with which I am acquainted. My experience of forcing Roses, and that is not inconsiderable, is that Roses, if to bloom in December, must be forced at the expense of considerable loss of plants, and the only result is a quantity of incipient ill-ripened wood and premature buds, and more frequently no buds at all, and I contend that at that period of the year, from an almost entire absence of solar heat, it is impossible to get anything like true colour or character into the blooms, which are too few to merit the expense attendant on their production. I now refer to the Hybrid Perpetual class, and my experience of the Duke of Edinburgh and Charles Lefèvre is that they are not Roses to recommend for early forcing when there are so many other kinds that supersede them. Further, I have found that to have the Hybrid Perpetual section in bloom at the end of January at the earliest, it is necessary that the plants be established in pots the previous season. This is a very important matter, as, by having them already established, there is a clear gain of a fortnight, or even three weeks, where the earliest kinds are employed, as the plant can be introduced into a gentle heat at once—treatment that I should certainly not advise in the case of plants freshly lifted from the ground and potted up for the occasion. Among Teas, I find that Madame Falcot, Safrano, and Devoniensis, as regards profusion and quality of buds, are the three best varieties for pots; and that Maréchal Niel and Gloire de Dijon are best planted out. I have treated the two latter in this way, and I expect about Easter to cut from 2,000 to 3,000 buds. Of the Hybrid Perpetual class, I have nearly 2,000 in one house in different stages of growth, and I find the following selection for early forcing to be the best:—Light varieties—John Hopper, Ann Alexiff, Victor Verdier, Mlle. Eugène Verdier, and La France; dark varieties—Madame Moreau, Beauty of Waltham, Fisher Holmes, Sénateur Vaisse, and Antoine Ducher. Any of your correspondents, contemplating forcing Roses this season with established plants, cannot well err in adopting the above selection, as, if not excited into growth too rapidly, there need be no fear, in a genial humid atmosphere, with a judicious application of air, that the plants will not set well for bloom.—J. D. G.

Orchids.

All newly-potted plants will require great care as regards watering, so as not to get the fresh material into a sodden condition before they have advanced considerably in growth, or until they have acquired a vigorous root action. A sprinkle with the syringe once a day, and twice on bright days, will, however, tend very much to keep them from shrivelling. All plants that require potting should have that attention as soon as possible. Plants to be top-dressed should stand in water half-an-hour before that is done; for, when thus situated, wood-lice or cockroaches will come to the surface, and may be destroyed. If this is neglected, these pests will soon destroy the young roots. Plants potted in the early part of last month should have a thin layer of Sphagnum in a fresh living state, cut about 1 inch in length, and placed on the surface. This helps to keep the soil fresh, and prevents green matter from making its appearance, which it always does where water has to be used freely. It will now be necessary to have all blinds seen to and fixed in their different places. The East India-house will require shading two or three hours on bright days, and the greater part of the Odontoglossums like heavy shading throughout the summer months. *O. citrosmum*, *O. Lepardinum*, *O. Rossii*, *Oncidium tigrinum*, *Cattleya maxima*, *C. speciosissima*, *Lælia majalis*, *L. albida*, *L. autumnalis*, *L. anceps*, *Barkerias*, *Epidendrum atro-purpureum*, *E. nemorale*, will all grow and flower without shade; but, in that case, they must be supplied with a greater quantity of water. Dendrobiums started into growth will now do well if placed in an early Vinery, where they can have the full benefit of the syringe. Plants of *Cœlogyne cristata*, that have flowered, should be removed to a cooler part of the house, where very little water must be given them—only, in fact, enough to keep them from shrivelling. It will be necessary to fumigate often this month, in order to keep down thrips and red-spider. Some Orchids are, however, apt to get injured by the smoke; and these, if they cannot be removed to another house, should be set on the floor. Orchid-houses will now be gay with Dendrobiums, Trichopilias, Cypripediums, Lycastes, Cattleyas, Masdevallias, Phalænopsis, Phajus, Odontoglossums of many kinds, and Vandas.—E. CULLEY, *Ferniehurst*.

Kitchen Garden.

Where large numbers of Asparagus beds exist, their produce might be distributed over a longer period than would otherwise be the case by simply protecting one or two of the beds, without having recourse to artificial heat in any way; although, of course, where the latter, by means of leaves and hot dung, can be obtained in

the alleys, vegetation will be considerably hastened. What I am, however, more especially alluding to is the fostering influence of mere protection in some shape or other. Glass, of course, is best; but, where that is not available, other coverings may be employed for the purpose. Be the coverings what they may, however, they should be taken off every warm sunny day and put on again at night; the object is to secure as much as possible of the sun's warmth, and then by coverings on cold frosty nights and days to prevent or check radiation. The surface of the beds should first be stirred and loosened up with a fork and then raked so as to leave a fine even surface; this should be effected on a fine dry day, as letting the air into the ground at this season dries and warms it considerably. In most places March is the usual month for planting the main crop of Potatoes. In low-lying districts, where spring frosts are very destructive, planting may be deferred till the first or second week in April. In dry hilly situations autumn planting may sometimes be adopted, but one of the principal objections to this is, it deprives the land of the beneficial effects of exposure after breaking it up deeply in winter, which lets the frost into it to pulverise and sweeten it. Where autumn planting is adopted I should only recommend it on very dry soils. So soon as the Potatoes come up in the spring the space between the rows should be deeply stirred with a fork to let in the air. I suppose amongst practical men there cannot be two opinions about the advantages to be derived from a frequent change of seed, especially in small gardens where there is a difficulty in carrying out any given system or rotation of cropping; but in procuring changes of seed Potatoes some pains should be taken to obtain them from a soil different in character to that in which it is intended to plant them, allowing due weight also, independently of the question of soil, to the elevation of the district from which they came. In this way, seed should be obtained from elevated places to plant in low damp situations, and *vice versa*. As a confirmation of the advantages of this, I may instance the large quantities of Scotch seed Potatoes planted annually in the Fens, yielding, as they do, the most satisfactory results. I am quite sure an intelligent application of this principle will be the means of so largely increasing the produce as to more than compensate for any additional expense incurred. Make a small sowing of Beet in boxes, in a gentle heat, to be transplanted in April for early use. Early sown Beet is liable to run to seed; therefore, unless the consumption is large, no great quantity need be sown just yet; and if the plants are not allowed to suffer for want of water, and are thinned out in time, they will be less liable to "bolt." I believe where Henderson's Pine-apple Beet can be obtained, as true and genuine as when it was first sent out, that there is no better table Beet to be had. Sow a few seeds of the various kinds of Broccoli, Kales, and other Winter Greens. It is best to divide the seeds into three portions, and make three sowings at intervals of a fortnight or three weeks, sowing the last in April; for, after that month, it is very little use sowing seeds, the produce of which require a long period of growth if they are to attain anything approaching their full development. It is always best, before the men leave the place to place nets over all seeds liable to be attacked by birds at the time of sowing. Thus no risk is run, and time is saved.—E. HOBDAV.

March in a Paris Market Garden.

Place in position frames intended for Melons, French Beans, and Tomatoes. Do the same with regard to cloches. Trench ground for Celery, Melons, Tomatoes, Cucumbers, and French Beans. Carry out manure to form hot-beds for these plants. If the manure is dry, spread it out and water it some days before it is used, or else make it into ridges. Continue to surface-dress the beds with spent manure, and clear out old trenches. Sowings.—March is the month for sowing in hot-beds and in warm sheltered parts of the garden. Pink and red Radishes, Carrots, Leeks, Scallions, Spinach, Asparagus, and Orach, may now be sown. In warm beds sow Egg-plant, Basil, Borage, American Spinach (*Basella*), white Celery, Rouen Chicory, Flageolet French Beans, Melons, Capsicum, and Potatoes. In cold beds under frames sow garden Beans and French Beans. In old hot-beds sow French Beans and white Mustard. In the open ground set Strawberries, and sow Fennel, Chervil, Cabbages, Brussels Sprouts, Cauliflowers, Broccoli, Seakale, Turnips, Onions, Sorrel, Pimpernel, Dandelion, Leeks, Peas, Purslain, Salsafy, Scorzenera, Savory, New Zealand Spinach, Tomatoes, and Thyme. Plant off-sets of Artichokes and cuttings of Sorrel (*Oxalis*). Plantings, Transplantings, and Interplantings.—Transplant into nursery-beds all the plants sown last month, such as Melons, Cucumbers, Egg-plants, and others. Plant out white Roman Lettuces, and grey and red-seeded Cabbage Lettuces in the open ground, and Rouen Chicory, Melons, Cucumbers, and French Beans in hot-beds. Interplant Cauliflowers in hot-beds. Plant out Garlic, Shallots, and Leeks sown in hot-beds; Chives, Asparagus,

Tarragon, and Potatoes in a sheltered place. Multiply the Chinese Yam by means of its bulbils. *Treatment of the growing plants.*—Hot-beds and forced crops require the same care as during the preceding month, *i.e.*, if the season continues to be severe. Open-air hot-beds should be covered with mats. When the sun is too warm, all the young plants should be covered from eleven to two o'clock for some days. Water them sparingly. Regular watering commences at the end of the month if it is warm and dry, but the frames should be watered whenever they want it. Crops gathered will be the same as in last month, with the addition of Purslain and early Potatoes. *Special Remarks.*—The open-air hot-beds may be devoted to Cucumbers, and frames may be exchanged for cloches, or *vice versa*. Cabbage Lettuces may be replaced by Melons, Tomatoes by French Beans, Melons by Onions, Cabbages, Corn-salad, Rampion, or Chives.

KEW IN SIR JOSEPH BANKS'S TIME.

PROFESSOR OWEN'S letter in your last number, though ostensibly on the subject of the permanence of varieties, seems rather to have the object of throwing a stone at Kew. His reference to the "prime intention of the wise administrator, Sir Joseph Banks, through whose suggestions and recommendations these botanical gardens were founded and developed," tempts me to quote a passage from a work by the late Dean Herbert,* well known as one of the most skilful, learned, and scientific cultivators of plants who ever lived, to show how far Professor Owen's idea of the way in which things were done at Kew under Sir Joseph Banks corresponds with the opinions of scientific men at that time. Dean Herbert, whose investigations on the hybridisation of plants, are too little known at present, would, I should imagine, have been the last to write so severe a criticism as the following, if any experiments were being made at Kew; but he says, on page 247:—"The illiberal system established at Kew Gardens by Sir Joseph Banks, whereby the rare plants collected there were hoarded with the most niggard jealousy, and kept as much as possible out of the sight of any inquirer, led, in the first instance, to a feeling of satisfaction whenever it was known that the garden had been plundered, and some of its hidden treasures brought into circulation; and the indifference with which such thefts were regarded, if they were not actually winked at, by cultivators, led to such great laxity of conduct that, until the practice was stopped by a prosecution, every private collection became exposed to the like depredations, and the falsehoods that were told to cover the thefts occasioned a great deal of confusion concerning the native habitation of plants introduced at that period. It was the narrow-minded doctrine of Sir Joseph Banks that he could only render the king's collection superior to others by monopolising its contents, and by so doing he rendered it hateful and contemptible, whereas, if he had freely given and freely received, and made its contents easily accessible to those who were interested in them, it would have been a pleasure and a pride to the nation. It is now near twenty years since I visited that odious and useless establishment. Formerly I went there often, but always in vain, for if I enquired for any rare plants, which I had reason to believe were in the collection, excepting those which from their size could not be concealed, my conductor always denied any knowledge of them; and if I asked to speak to a person better acquainted with the plants, I was told I could obtain no further information. The multitude of rare plants that have flourished and perished there unobserved, I believe to be very great. I owe no thanks to that establishment, but for the mere permission to walk straight forward through the houses. I must do Mr. Salisbury the justice to say that he repeatedly remonstrated with Sir Joseph Banks in vain on the subject." What a contrast this is to the management of the gardens at the present time, every one who has had anything to do with them must well know. The authorities, from the Director downwards, both in the herbarium and the gardens, though often overdone with work, are always ready to give any information and advice in their power about plants taken or sent there; and the liberality with which all duplicates of plants, alive or dead, are distributed and exchanged, is well known to hundreds of correspondents in all parts of the world. Though, of course, a private individual like myself has no right to speak on such a matter, I should think it impossible, with the very small staff of skilled gardeners at Kew to carry on such investigations as Professor Owen suggests, which require intelligence of the highest order as well as the most minute and careful attention, to be of any value; and, as to the fact of Lieut. Cameron's collection having gone there instead of to the British Museum, I say, as I think nine out of ten unprejudiced persons would say, that collections in any branch of natural history made by the Government, or by private enterprise, are best placed where they will be most prized and made most useful. I can only express

a feeling—which I am sure will be understood by all who take an interest in, and have had to do with, Kew Gardens—of the deepest gratitude to the authorities and the staff employed there for the universal courtesy and help which I have received on many occasions; and, in conclusion, I would say that, so long as the gardens are carried on as they are now, it is the duty of every lover of plants in this country to send the first duplicate of any new or rare plant he may have, alive or dead, to Kew Gardens.

H. J. ELWES.

Miserden House, Cirencester.

THE FERNS OF NORTH AMERICA.

By JOHN H. REDFIELD.

For many reasons, writers upon the Flora of North America have found it convenient and useful to limit their province to that part of the Continent lying north of Mexico; excluding also the West India Islands. In considering the distribution of the Ferns of North America a similar limitation will be followed, which will exclude a large number of tropical forms that can be better studied in connection with South American or Caribbean geography. As Ferns are for the most part very dependent upon shade and moisture, their distribution over the Continent will be largely determined by the rainfall of the different portions; and the conditions which distribute the forest legions will show us where we may expect to find the largest number of species, and the greatest development in number and luxuriance of individuals. And as many species live only in the crevices of rocks, or root only in rock-loving mosses, they find in the rugged cliffs of mountain sides all the necessary conditions. So, as we might expect, the eastern portion of the Continent—traversed from N. E. to S. W. by the Appalachian range of mountains which receive and condense the moisture of the winds from the Gulf of Mexico and the Atlantic—furnishes the greatest number of species. Near the Gulf the moisture of the atmosphere is accompanied by sufficient heat to permit the establishment of many species belonging to the Carribean province. These soon disappear as we go northward, and as we proceed into Canada and the British possessions, many of the Alleghanian forms die out, and are succeeded by more hardy and cold-enduring species. A few of these continue into high arctic latitudes. Passing now westward, beyond the Alleghanian slopes, into the flat, treeless prairies of the Mississippi Valley; and still farther, into the arid plains which extend to the foot of the Rocky Mountains; we have a vast region, in which the species gradually diminish in number, and finally almost entirely disappear. Even in the Rocky Mountains we find many of the needed conditions wanting. An atmosphere almost devoid of moisture through much of the year, and so free from cloud as to give burning effect to the direct rays of the sun, limits the Fern growth to deep rock clefts and to the valleys of snow-fed streams. A few Boreal and Siberian forms have crept downwards from the north, meeting some of the drought-resisting species which have made their way from Mexico. Beyond the Rocky Mountains we enter a wide-spread desert, utterly incompatible with Fern life, though the island-like snow-covered mountain ridges, which here and there emerge from the vast expanse of the thirsty plains, occasionally give shelter to a few hardy species. As we approach the western borders of the Continent, the noble Coniferous forests of the Cascade Mountains and of the Sierra Nevada again offer inviting conditions, and accordingly we have here a larger proportions of Ferns than we have seen since leaving the Appalachian regions. In California the dry plains, which lie between the Sierras and the coast range, again interrupt the Fern life, which, however, re-appears upon the coast range. As we go northward along this western coast, the rains become more abundant and the Ferns more luxuriant; but, as we go towards Southern California, aridity again prevails, restricting the number of species and individuals, and modifying their types. Abundant as is the Fern-growth of Alaska, Washington, and Oregon, the number of species is much less than upon the Eastern border of the Continent. A few species are peculiar, while the remainder are Asiatic forms which seem to have made their way across the Straits or over the Aleutian Isles even as far south as California, there meeting a few types which have their homes in the Andes.

The number of species which inhabit North America, as here defined, is about 125. They may be arranged in six geographical divisions, *viz.*:—1. Cosmopolitan; 2. Boreal; 3. Appalachian; 4. Pacific; 5. New Mexico or Central; 6. Tropical.

I. Cosmopolitan.—Widely distributed over the globe, in both temperate and tropical regions.

Pteris aquilina.

Asplenium Trichomanes.

The first of these, thriving in sandy barrens, occurs abundantly in both the Old and New World and in the islands; from Lapland in the north to New Zealand and Tasmania in the south. In North America it extends from Labrador and Alaska southward to the

* Herbert's "Amaryllidaceæ, or, Treatise on Bulbous Plants." London, 1837.

isthmus, avoiding only the arid and alkaline plains of our western interior. The other species of this group thrives only in the crevices of shaded rocks, and this condition alone seems to limit its distribution. Throughout the globe it is represented almost as universally as the *Pteris*. There are a few others of the species which are so widespread as almost to claim a place in this division, but which it will be more convenient to consider in the other groups.

II. Boreal.—Inhabiting (with a few exceptions) the northern portion of the United States, extending through Canada and British America, some species even reaching Labrador, Greenland, and Alaska, and nearly all represented also in the northern portions of the Old World.

<i>Phegopteris polypodioides</i> ,	<i>Cryptogramma crispa</i> ,
" <i>dryopteris</i> ,	<i>Cheilanthes argentea</i> ,
" <i>alpestre</i> ,	<i>Cystopteris fragilis</i> ,
<i>Struthiopteris germanica</i> ,	" <i>montana</i> ,
<i>Aspidium Lonchitis</i> ,	<i>Woodsia hyperborea</i> ,
" <i>aculeatum</i> ,	" <i>glabella</i> ,
" <i>fili-mas</i> ,	" <i>ilvensis</i> ,
" <i>fragrans</i> ,	" <i>oregona</i> ,
" <i>spinulosum</i> ,	<i>Botrychium Lunaria</i> ,
<i>Scolopendrium vulgare</i> ,	" <i>matricariaefolium</i> ,
<i>Asplenium viride</i> ,	" <i>lanceolatum</i> ,
" <i>septentrionale</i> ,	" <i>simplex</i> ,
<i>Pellaea gracilis</i> ,	" <i>boreale</i> .
<i>Lomaria spicant</i> ,	

Of the species here grouped we note that *Phegopteris alpestre* has only been observed in North America upon the western coast—coming down as far as California, according to Mr. Baker—and upon the coast of Greenland. *Aspidium filix-mas*, so abundant in the Old World, is very restricted upon this Continent. It is occasionally found in Canada and near Lake Superior, and occurs rarely in the Rocky Mountains. *Aspidium aculeatum*—so wide-spread in some of its forms—is local upon our Continent, and has not been seen below about 42°. *Scolopendrium*, so abundant in Great Britain, is still more restricted here, and seems confined to a few rocky glens which open into the ancient basin of the great lakes. *Asplenium septentrionale*, widely distributed in the mountains and colder portions of Europe and Asia has, on our Continent, been seen only in the Rocky Mountains, where it reaches as far south as latitude 32°. *Asplenium viride* does not penetrate the United States, nor is *Woodsia hyperborea* represented with us, unless *W. glabella* be viewed as a variety of it. *Woodsia oregona* might perhaps be ranked with the Pacific or Rocky Mountain species; but, as it has been noticed as far eastward as Lake Superior, it may claim place with the boreal species, though restricted to the New World, so far as known. *Cystopteris montana*, a high northern species of the Old World, has been seen in Alaska; also far north in the Rocky Mountains, and on the north of Lake Superior, and in Labrador; while *C. fragilis* is so widespread on the globe as almost to deserve a place in our first division, and, were it not for its northern proclivities, might be called an Appalachian species. *Pellaea gracilis* would be an exclusively American form but for the fact that it occurs in the Himalaya Mountains, where several others of our American species also appear. *Lomaria spicant*, common in the northern regions of the Old World, appears only on our western border. *Botrychium Lunaria*, frequent throughout northern Europe, and not rare in British America, barely enters our own boundaries; but the other *Botrychia* of this group have nearly all been occasionally found within our limits, and are, perhaps, more abundant than is supposed, their small size and isolated habit enabling them to elude detection. *Cheilanthes argentea* is a Siberian species which reaches the Aleutian Islands, and perhaps Alaska.

III. Appalachian.—Extending throughout the mountain and hilly regions of the States east of the Mississippi, often to the coast, and northward into Canada, and in a few instances also inhabiting the Old World.

<i>Polygodium vulgare</i> ,	<i>Aspidium cristatum</i> ,
<i>Phegopteris hexagonoptera</i> ,	" <i>Goldieanum</i> .
<i>Onoclea sensibilis</i> ,	" <i>marginale</i> ,
<i>Cheilanthes vestita</i> ,	" <i>acrostichoides</i> ,
" <i>tomentosa</i> ,	<i>Cystopteris bulbifera</i> ,
<i>Pellaea atro-purpurea</i> ,	<i>Woodsia obtusa</i> ,
<i>Adiantum pedatum</i> ,	<i>Lygodium palmatum</i> ,
<i>Camptosorus rhizophyllus</i> ,	<i>Osmunda regalis</i> ,
<i>Asplenium filix-femina</i> ,	" <i>Claytoniana</i> ,
" <i>thelypteroides</i> ,	" <i>cinnamomea</i> ,
" <i>angustifolium</i> ,	<i>Botrychium virginicum</i> ,
" <i>ebeneum</i> ,	" <i>ternatum</i> ,
" <i>ruta-muraria</i> ,	<i>Ophioglossum vulgatum</i> ,
" <i>pinnatifidum</i> ,	
" <i>montanum</i> ,	<i>Asplenium marinum</i> ,
" <i>Bradleyi</i> ,	<i>Woodwardia virginica</i>
<i>Dicksonia punctilobula</i> ,	" <i>areolata</i> ,
<i>Aspidium Thelypteris</i> ,	<i>Schizaea pusilla</i> .
" <i>Noveboracense</i> ,	

Of the species in this division we remark that *Onoclea sensibilis*, though absent from Europe and most of Asia, appears in Manchuria and Japan. I am not aware that it now occurs in the western portion of our own Continent, but it is a very interesting fact that it has been discovered in a fossil state in the eocene tertiary on the eastern border of Montana. *Cheilanthes vestita* is hardly found north of 41° extending south-westerly along the mountainous region to about 34°. *C. tomentosa* seems to prevail along the western slopes of the mountains, and reappears in the mountains of Arkansas and in the Rocky Mountains. *Pellaea atropurpurea* stretches to the north-west even to Slave Lake, and south-west to the Ozark Mountains, and occurs sparingly in the Rocky Mountains. Our lovely *Adiantum pedatum* is wanting in Europe, but appears in the Himalayas, in Manchuria and Japan; again in Alaska, thence along our western coast as far as California. *Camptosorus rhizophyllus* is limited to this district, but an allied species without auricles, occurs rarely in Siberia. *Asplenium filix-femina* is almost a cosmopolite, but its fellow in the section *Athyrium* (*A. thelypteroides*) occurs elsewhere only in Asia. *Asplenium ebeneum* is rather tropical in its relations, and extends into tropical America as far as Peru, and appears in the Old World only in South Africa. Yet with us it extends north to about 45°. *Asplenium montanum* is appropriately named, and is strictly Appalachian. It has been observed as far north as Ulster Co., N. Y., extending thence south-westerly to Alabama. *Asplenium pinnatifidum* is rare and local, and has been reported, so far as we know, only from Pennsylvania, North Carolina, Southern Illinois, Missouri, and Arkansas. It has been erroneously considered by some as a variety of *Camptosorus rhizophyllus*, but not only do the generic distinctions hold which Hooker indicated, but its habit is entirely different. Instead of running freely over the surface of rocks, rooting in the Moss which covers them, it grows deep in the retreating crevices of precipitous cliffs, rooting itself most tenaciously to the rock, and is rarely or never proliferous. *Asplenium Bradleyi* has, as yet, been seen only in East Tennessee and Kentucky. *Aspidium thelypteris* is widespread in the northern hemisphere, and less so in the southern, but its very near relative *A. noveboracense* is strictly Appalachian. So also are the rest of the *Aspidia* of this division, except *A. cristatum*, which also appears in Europe. *Lygodium* is, for the most part, a tropical genus, and most of its species are widespread in warm regions. Our own beautiful species, however, is strictly confined to this division, and occurs but rarely in it; usually in wet sandy alluvium. Of the three *Osmundæ*, *O. regalis* is almost cosmopolitan. *O. cinnamomea* extends from far north into the tropical regions of South America, and, though wanting in Europe, it reappears in Eastern Asia; while *O. Claytoniana* is another species common only in the Appalachian and the Himalayan region. All three are wanting west of the Rocky Mountains. Both of the *Botrychia* of this group are occasionally found in the northern hemisphere of the Old World. The last four species of this group are rather maritime than Appalachian. *Asplenium marinum* is strictly a littoral species, but it is somewhat doubtful whether it is entitled to a place in our catalogue. It is said to have been collected upon the coast of Newfoundland by Kendal more than thirty years ago, but later collectors have not confirmed it. *Woodwardia areolata* is limited to the marshes of the seaboard states, from Cape Cod southward. *Woodwardia virginica* has about the same range, but also appears in the regions bordering on the St. Lawrence and the great lakes. Our little *Schizaea* is known only in the Cedar swamps of New Jersey, at three or four points over a limit of about thirty miles, although it is said to have been collected in Newfoundland many years ago. Perhaps thorough search in appropriate localities may yet prove its range wider than we know.

IV. Pacific.—Extending along the western border of the Continent at points from Alaska to California; in a few cases appearing also in the Rocky mountain region.

<i>Polypodium falcatum</i> ,	<i>Pellaea andromedæfolia</i> ,
" <i>intermedium</i> ,	" <i>Bridgesii</i> ,
" <i>californicum</i> ,	" <i>densa</i> ,
" <i>Scouleri</i> ,	" <i>ornithopus</i> ,
<i>Gymnogramma triangularis</i> ,	<i>Aspidium munitum</i> ,
<i>Notholaena Newberryi</i> ,	" <i>californicum</i> ,
<i>Cheilanthes californica</i> ,	" <i>argutum</i> ,
" <i>gracillima</i> ,	<i>Woodsia scopulina</i> .
<i>Pellaea Breweri</i> ,	

One or two additional species occur in California, which will be more appropriately considered in the next group. *Gymnogramma triangularis* extends from Vancouver's Island to Southern California and reappears in Ecuador, South America. *Notholaena Newberryi* is only known at present in Southern California. *Cheilanthes gracillima* has been noted from latitude 44° to 35°. Mrs. Lyell must be wrong in ascribing it to Missouri. *Woodsia scopulina* has been seen from latitude 49° to Columbia River, and appears also in the

Rocky Mountains as far south as latitude 39°. We as yet know too little of the range of most of these species to assign a precise limit.

V. New Mexican.—Inhabiting the central mountain regions of New Mexico and Colorado; many of the species extending thence into Mexico and some even to South America, and a few of them also occurring in California.

<i>Gymnogramma pedata</i> ,	<i>Cheilanthes lanuginosa</i> ,
<i>Notholæna sinuata</i> ,	" <i>Wrightii</i> ,
" <i>ferruginea</i> ,	" <i>microphylla</i> ,
" <i>candida</i> ,	<i>Pellæa pulchella</i> ,
" <i>cretacea</i> ,	" <i>flexuosa</i> ,
" <i>dealbata</i> ,	" <i>Wrightiana</i> ,
" <i>Fendleri</i> ,	<i>Adiantum chilense</i> ,
<i>Cheilanthes aspera</i> ,	<i>Woodwardia radicans</i> ,
" <i>Fendleri</i> ,	<i>Aspidium juglandifolium</i>
" <i>Lindheimeri</i>	<i>Anemia mexicana</i> .
" <i>Eatoni</i> ,	

The prevalence of the drought-resisting genera *Notholæna*, *Cheilanthes*, and *Pellæa* in this list will be at once noticed. The precise range of many of these we have yet to learn. *Gymnogramma pedata*, *Notholæna ferruginea*, *N. candida*, *N. cretacea*, *Cheilanthes microphylla*, are all known to extend into Mexico and Central America. *Adiantum chilense* and *Woodwardia radicans* also occur in California; but their relations are rather with this group, and the latter species is the only one of the group which also appears in the Old World.

VI. Tropical.—Inhabiting the border of the Gulf of Mexico, most of the species extending into the West Indies and Tropical America:

<i>Acrostichum aureum</i> ,	<i>Asplenium dentatum</i> ,
<i>Vittaria lineata</i> ,	" <i>myriophyllum</i> ,
<i>Polypodium Plumula</i> ,	<i>Aspidium patens</i> ,
" <i>incanum</i> ,	" <i>ludovicianum</i> ,
" <i>aureum</i> ,	" <i>unitum</i> ,
" <i>phyllitidis</i> ,	<i>Nephrolepis exaltata</i> ,
<i>Cheilanthes alabamensis</i> ,	<i>Trichomanes Petersii</i> ,
<i>Pteris cretica</i> ,	" <i>radicans</i> ,
" <i>longifolia</i> ,	<i>Anemia adiantifolia</i> ,
<i>Adiantum Capillus-veneris</i> ,	<i>Ophioglossum bulbosum</i> ,
<i>Blechnum serrulatum</i> ,	" <i>nudicaule</i> .

Of the above, we note that *Trichomanes Petersii* is quite local, having been seen only in Alabama and Florida. *Cheilanthes alabamensis* reaches through Texas into New Mexico. *Polypodium incanum* extends farther north than any other in the group, reaching Virginia, on the sea-board, and extending up the Mississippi Valley into Illinois, but avoiding the colder mountainous region between. *Adiantum Capillus veneris* reaches North Carolina on the east of the mountains and Missouri on the west. It also reappears in Utah and Arizona. This species is almost cosmopolitan and reaches high latitudes in the Old World, but with us is limited as above. The two species of *Pteris* of this group also extend around the globe except in high latitudes. Of the 125 species here enumerated sixty-nine, or about 55 per cent., are found in the New World only, and of these sixty-nine about fifty-three, or over 42 per cent. of the whole, are restricted to the limits we have defined, except that a few of them extend more or less into Mexico. We have, then, seventy-two species left, which we share with other portions of the world—some of which are represented in more than one other region. A brief glance at the numerical relationship of these is all that we have space for. We have forty species in common with Europe, of which four are not found elsewhere. We have thirty species in common with the Himalaya, or northern India, of which two are not found elsewhere. We have, in common with northern or eastern Asia, thirty species, of which two are not found elsewhere. If we make a similar comparison with the Himalayan region and the north and east of Asia united, we have forty-six species in common, of which five are exclusive. If we add Europe to this comparison, we have fifty-two species in common, of which twenty-six are exclusive. We have also twenty-nine species which occur in the West Indies, twenty-six which occur in Africa or southern Asia, thirty-six which inhabit South America, and nineteen which occur in Polynesia. The preponderance of Asiatic forms in our Fern flora will at once be perceived, and opens an interesting field of inquiry. Those wishing to enter upon it are referred to Dr. Gray's "Observations on the Relation of the Japanese Flora to that of North America, and of other parts of the Northern Temperate Zone;" in the sixth volume of "Memoirs of Am. Acad. Arts and Sci.," second series; also in "Silliman's Journal," Sept., 1859. And in this connection the student will find the elaborate and excellent tables in Mrs. Lyell's "Geographical Hand-book of Ferns" of great service. Seldom has been brought together such a mass of botanico-geographical facts, so well systematised, and so convenient for use.—"Torrey Botanical Club Bulletin."

THE KITCHEN GARDEN.

THE READING POTATO TRIALS.

THE Potato crop is so valuable, that any facts throwing light upon the causes of success or failure will be of more than ordinary interest; allow me, therefore, to give you the result of some trials made at Reading with 350 different kinds of Potatoes last year. They were all grown side by side, under precisely the same conditions; a capital opportunity is therefore thus afforded of testing how far a change of seed, so much recommended, is worthy of attention. In one case there were eleven distinct samples of one variety, each sample planted having been grown the year before on a different kind of soil, in various parts of the country, expressly for seed purposes. The first lot was grown in the same field the previous year in which the trials were made last season, thus effecting no change. The next was from a distance, off poor soil, and, though planted alongside No. 1, and grown on exactly the same extent of ground, No. 2 produced quite double the crop of No. 1. No. 3 was from a very heavy loam in the west of Berkshire, and it came out much inferior to No. 4, which was grown in Essex on poor light land, almost without manure. No. 5 from Oxfordshire, and No. 6 off fen-land country, both evidently found a suitable change in the light loam about Reading. Nos. 7 and 8 were off rich land, and the yield was small, but nothing approaching the wretched crop produced by No. 9, which was grown within a few yards of the same spot last season. No. 10, again, which came from a distance, was good; but No. 11, which, curiously enough, was grown within a quarter of a mile of the trial ground was the best of all; on inquiry, however, I learned that it was off quite a different soil, thus fully bearing out the soundness of the view that a change of seed is necessary. Messrs. Sutton, in fact, informed me that the simple change from any of these different districts to their trial ground was valuable. Yet by far the largest of the crops were from those samples which represented Potatoes grown on very poor, and especially fen, land. The change from black peaty soil to the light loam of the trial plot was evidently most suitable. Apart from the question of change of seed, it was most interesting to note the various characteristics, and relative merits, of the different varieties. Here were Victorias, Queens, York Regents, Patterson's Regents, Walker's Regents, Dunbar Regents, Dalmahoy's, Gryffe Castle, Rocks, Wellingtons, Shaws, Oxford's, Fortyfolds, Drummond's Prolific, Flukes, Lapstones, Skerry Blue, and a score more, all giving very different results, both in quality and quantity of produce. One or two varieties particularly struck me as being evidently larger croppers, of finer quality, and freer from disease than the rest. Of Americans, I should recommend Snowflake, Willard, Early and Late Rose, and Climax, as being the best for general cultivation, while King of the Earlies is peculiarly suitable for forcing. Amongst English varieties, the sorts most reliable for early use appear to be a new selection of Ashleaf, called Sutton's Ashleaf Kidney, Early Hammer-smith, a fine prolific Kidney, which has taken many prizes, and early Giant King, a round Potato of fine quality. For late use, Sutton's New White Fluke is certainly one of the best. Oxfordshire kidney is a fine Potato, while last, but not least in importance, comes Red-skinned Flour-ball and Hundredfold Fluke. The Red-skin Flour-ball is a large, round pink, rough-skinned variety, with a white flesh, shallow eyes, and possessing the remarkable recommendation of producing none but large tubers, all fit for the table. From eight to twenty Potatoes are often turned up from under each root; and, as they grow immediately below the haulm all together, one toss of the fork brings them to the top. This being such a robust-growing variety, seemed to be better able to dispense with the necessity for change of seed than older sorts; still, there was a marked difference in the quantity of produce from some lots, a circumstance which could only be traceable to the want of such a change. There is one thing about this Potato which should be borne in mind, and that is that it is essentially a late-eating sort, and is not often fit for the table before February; and it should always be steamed, not boiled. The old American Red Seedling, with its numerous deep eyes and yellow flesh, and other sorts, are often substituted for the Red-skinned Flour-ball; care should therefore be taken to get the genuine Flour-ball. The beautiful striped Hundredfold Fluke is another fine Potato, and, as this variety is not only a good keeper, but also as good for table when dug as in the spring, it cannot fail to become a favourite.

ALNWICK.

Seville Long-pod Bean.—This variety of Broad Bean has been for many years in cultivation on the Continent, especially in Spain, where it has done good service in the way of supplying food during the war. It well deserves the high commendations lately bestowed upon it, and ought to be in every good garden. The true

variety, however, is somewhat difficult to obtain, inasmuch as long-podded Beans, in every respect different from it, are often supplied for it; while a Spanish Bean, very similar to it as regards seed, but short-podded, is sold under the name; hence its introduction into English Gardens is but slow. It is, however, the earliest and longest podded Bean in cultivation, and a variety quite distinct from any other. Its pods are tender, and fit for use ten or twelve days before those of the common long-podded sort grown in the south of France. It was stated a few weeks ago in your columns, that the common long-pod Bean was the earliest; that is not, however, the case, for in English gardens, the Seville Bean is from four to six days earlier than that. It grows moderately robust, with one or more slender stems, according to the distance at which the plants stand apart; its leaves are of a bright green colour, and its pods, three to six on each plant, are extremely long, measuring often from 6 to 10 inches in length, and 1 inch broad; they are of a bright fresh green colour, quite pendent, and contain from five to eight fine Beans, which are bright fawn coloured, oboval, flattened, and the largest after the Windsor varieties. They should be sown now, as soon as possible, in a warm, well-protected border, which should be slightly covered with rough litter, in the event of frost. Being only a moderately-heavy cropper, and not so hardy as some other sorts, it is not so well adapted for field culture in England as it is on the Continent; but, as a garden Bean, it is well worth attention.—D. GUIHENEUF.

Mr. Buckmaster on Potato-boiling.—Mr. Buckmaster, the South Kensington professor of the art of cookery, has been lecturing in the provinces to crowded audiences upon the art of Potato-boiling. According to Mr. Buckmaster, Nature has put a very great deal into the Potato, and man does not get enough out of it, precisely because he knows not the first principles of the new South Kensington philosophy. We ought, it seems, to pick our Potatoes all of a size, for a big Potato should stay in the water longer than a small one. We ought to wash each individual tuber, handling it tenderly, and clearing its delicate cuticles of all impurities with a soft-haired scrubbing-brush, but on no account to pierce the tender rind, lest the subtle flavour should escape through the wound. Potatoes thus prepared, and carefully boiled in spring water qualified with a requisite admixture of salt, are, we understand, the typical form of carbonaceous food, and if taken with a due admixture of nitrogenous elements, such as are yielded by cheese, buttermilk, sound bacon, and, best of all, a small allowance of good lean meat, are capable of forming a wholesome and a palatable dietary.

The Early Rose Potato in France.—In France this is the earliest of all known Potatoes, and there, in the southern departments, it is possible to grow two crops in the same season. The best way to prepare the soil for the Early Rose is to spread a thick coating of well-rotted stable manure on the surface in September, and cover it in at once. As early in March as the season will admit of the operation, sow broadcast a mixture of equal parts of unleached ashes, guano, and finely ground plaster, at the rate of 300 to 400 lbs. per acre; then harrow in both directions, and plant. To work the ground well, to replace the ordinary manure from the stable at the time of planting, by assimilable salts and fertilisers, and to be sure to restore to the soil the potash it lacks, in the form of ashes, crude potash, or nitrate of potash—such is the true practice to follow in order to obtain an abundant crop of excellent Early Rose Potatoes.—“Cultivator.”

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Sowing Celery.—Celery sown on a warm spot just now will be early enough for very many places. It is necessary to prick the young plants out when large enough, leaving a space of at least 6 inches between them; this allows them to develop into sturdy little “stuff” by the time the trenches are ready for them. With attention, these will be fit for use in September. Celery stands the winter better if grown with little or no dung. Water and mulch after planting; they will then require little more moisture.—R. P. B.

Two Crops from Forced Seakale.—Seakale, like other members of the family to which it belongs, when cut over, will produce a quantity of young shoots in a short time. If forced Seakale is cut as soon as it is fit for table, a second crop will follow on the same plants directly. The second shoots are not so strong if the first are allowed to grow too much; and, as a matter of course, they will not succeed so quickly. They will also become “spindly” if the temperature be higher than from 50° to 55°; the flavour is better when grown cool.—R. P. B.

Blanching Lettuces.—Can any of your correspondents tell me the best method of blanching Lettuces?—X. [Many kinds of Lettuce, including True Paris Cos and Myatt's Green Cos, are, to a certain extent, self-blanching; the only thing required is to tie round the top of the leaves with a string of matting, an operation which should be done when the Lettuce is quite dry. In summer they take about eight days to blanch. We have been cutting all winter the variety known as Black Seeded Brown Cos. This we simply cover up outside with dry Fern, which both blanches and protects.—R. GILBERT, *Barghley.*]

THE FUTURE OF THE ROYAL HORTICULTURAL SOCIETY.

I SHOULD be greatly obliged if you would help me in a matter which I have much at heart. The Royal Horticultural Society is now divided into two sections with different interests—the local Fellows, who use the South Kensington Gardens as a recreation ground, and the horticultural Fellows, who only care for them as a convenient place for holding shows and meetings. It appears likely that the two sections will more or less amicably separate, that the local people will bear the cost of the gardens, and that the horticulturists will have what funds they can collect to spend on horticulture, properly so called. A long experience on the Council has satisfied me that the Society would be much stronger, and more influential with a very large number of Fellows all over the country, at a guinea subscription, than with a limited number of Fellows at a high subscription. Some very influential people would cordially back this plan, but doubt whether enough guinea Fellows would co-operate. I am most anxious to have a practical fact for them. While talking over the question at the show on Wednesday, one of the great nurserymen (Mr. Standish) said, “I know something of Manchester, where I am doing some large work, and I think many would join there.” It then struck me that Manchester would be an excellent test place. At the old Chiswick Garden, where new vegetables and fruit are grown side by side, judged, and names reduced, by some of the best men in the country, and at the Committee meetings at South Kensington, to which all new flowers and fruits are sent from all parts, and most carefully judged and reported on, real horticultural work is done which benefits the whole country. I do not think it is too much to ask a guinea from those who care for a garden, and who would like to keep the old Society in an efficient state. I have enclosed a paper, and should be very much obliged if you would sound your friends and see how many names could be collected in the next fortnight. I enclose a pamphlet to show that it is no new idea. GEORGE WILSON.

Heatherbank, Weybridge.

[The following is the “paper” above alluded to:—

“Should the Royal Horticultural Society admit to fellowship at a guinea annual subscription, giving for this a transferable ticket of admission to all the Society's shows at South Kensington and elsewhere, and every day to Chiswick Garden, we, the undersigned, would be willing to become Fellows on this footing.”

(Name)

(Address.)

Guinea Fellowships seem to us to be a good suggestion, and we shall be happy to receive the names of such as are willing to join the Society on this footing at our office, 37, Southampton Street, Covent Garden, London.—ED.]

Poisoning by Monkshood.—Your illustration and article in THE GARDEN on this plant recalls to my mind a circumstance that happened in this neighbourhood last summer, which goes far to prove that it is a very dangerous plant to grow near fences over which cattle can reach. It is a plant of a very striking appearance, and, when in flower, is very ornamental, and for this reason it is rather common in cottage gardens in some places, whilst the fact of its being a deadly poison is known to but few. Last summer a valuable horse had a narrow escape from death from nibbling a few flowers just inside a cottage garden, where his owner had left him tied to the fence a minute or two, whilst he made a call. Fortunately he had only eaten a small portion, and a skilful veterinary surgeon was at hand, who, although he did not know the plant, saw from the symptoms that the horse had taken a virulent vegetable poison, and, therefore, knowing what course to take, the result was not fatal; but I have no doubt this plant has been the cause of a good deal of mischief in this way, without its agency being traced so clearly as in this case.—E. HOBDAV.

National Fruit Culture.—As a matter of increasing national concern, which affects not one class only, but all classes, the Vegetarian Society has been directing attention to the importance of national fruit culture. Nothing but good, we should think, can come of its doing so. The question of food supply of great Britain has not received that attention which its importance warrants. Large areas of land are devoted to a purpose which affords the lowest yield in food produce of any—that of cattle breeding to supply the demands of the butcher. Other extensive tracts of land are occupied with the production of grain for the use of the maltster—an absolute waste, viewed in the light of national economics, against which every intelligent citizen needs to protest. Other large areas are lying untilld to no one's profit. Throughout the kingdom are many thousands of miles of hedgerows and of abutting space along our highways, river-ways, canal-ways, and railways yielding rarely any food product whatever, where continuous lines of fruit trees might be planted. The advantage of shelter, fruit, and beauty are all in favour of this

course. Is it too much to earnestly urge on all the patriotic duty of cultivating the soil of Great Britain so as to afford the maximum yield of food for the daily increasing population which dwells on its surface? Can we do better than direct the attention of all who hold, rent, or till any portion of land, however small, to the costlessness and productiveness—in a word, the patriotic duty of national fruit culture.

A CHAPTER ON TOMATOES.

DURING the past few years much has been said and written concerning the merits of the different varieties of Tomato. In size, flavour, smoothness of skin and solidity of flesh, there has certainly been great improvement made; but among the scores of varieties that have been introduced within the last ten or fifteen years, what have we now that is very much earlier than the old Early Smooth Red? In order to test this matter by actual comparison, a correspondent of "Moore's Rural New Yorker" obtained seeds of eighteen varieties; and to be certain of each kind being genuine, they were purchased either of the originators or of first-rate seedsmen. The seeds were sown in a hotbed April 1st, transplanted into a cold frame when the plants had attained 3 or 4 inches of growth, and again transplanted to the open ground about the 1st of June. Great care was taken to treat them all as nearly alike as possible throughout each season. The table below shows the time of ripening of the first fruits of each kind in 1871, 1872, and 1873. Hathaway's Excelsior possesses more good qualities than any other in the list. It is as early as any, of good size and flavour, and is round and smooth without crease or wrinkle; flesh very solid, and equal to the Trophy in this respect. The Trophy is an excellent kind, but is very liable to rot before getting thoroughly ripe. General Grant and Alger are also good sorts, and have one good quality not possessed by any others—their fruit grows in large bunches and ripens up all at once, early in the season:

	1871.	1872.	1873.	Average.
Hathaway's Excelsior was ripe	July 23	Aug. 13	Aug. 5	Aug. 3
Alger	24	9	15	6
Early Smooth Red	26	12	10	—
General Grant	27	12	12	7
Sims' Cluster	29	19	8	8
Large Smooth Red	25	11	19	3
Keyes' Early Prolific	28	—	19	—
Hubbard's Curled Leaf	—	10	12	—
The Cooks' Favourite	29	15	—	—
Maupay's Superior	27	20	13	10
Arlington	—	—	14	—
Trophy	30	18	15	11
Earley's Defiance	—	12	19	—
Cedar Hill	31	—	—	—
Fegee Red	28	16	20	11
Golden Striped	—	20	14	—
Lester's Perfected	Aug. 5	—	22	—
Tilden	1	—	—	—

Sunken Boilers.—From what has been stated by Messrs. Williams and Hobday, it is evident that the practice of setting boilers below their work is one maintained more from custom than necessity. It doubtless arises from a belief that, as the heated water in the boiler expands, it can only circulate rapidly if the whole of the flow-pipes be above the boiler-level, whereas it is evident that if the heated water be carried from the boiler immediately to a certain height it will flow freely through all parts of the heating apparatus; thus the water would rise to the highest point of expansion, and flow all through the remainder of the pipes by means of gravitation. If a good flow was produced by expansion, an equally rapid circulation elsewhere must result, as the return water would enter the boiler as fast as it passed out at the top, and thus a constant and equable flow would be maintained. Nothing can be more simple than the plan described by Mr. Williams, viz., a syphon pipe fixed a few feet above the top of the boiler with an expansion pipe inserted into the syphon. What works well in his case will work equally well anywhere else. And with this experience on record, sunken boilers may be pronounced useless.—A. D.

New Groves of Giant Trees.—It has been supposed that the Sierra Sequoias, or big trees of California, are confined to a few small and isolated groves. It was discovered last summer that a body of big-tree timber in Fresno county is not properly a grove, but a forest, extending for not less than seventy miles in a north-west and south-eastward direction, with a width in some places of ten miles, and interrupted only by the deep canons which cut across the general course of the forest. Different persons have traced the forest from the basin of the Tule river, in latitude 36° 20', across those of the Kaweah and King's, to that of San Joaquin. The elevation has not been carefully measured, but is supposed to vary from 4,000 to 6,000 feet. Unlike the groves further north, this forest consists mainly, and in some places almost exclusively, of the big tress, and there are also a multitude in all the ages of growth—some just sprouting, and

others saplings only 2 or 3 feet through. The largest standing tree as yet measured is 40 feet in diameter; a charred stump—the tree itself having disappeared—measures 41 feet across. A tree 24 feet in diameter, 4 feet above the ground, is precisely the same thickness 60 feet higher. A fallen trunk is hollow throughout its length, and the hole is large enough to drive a horse and buggy 72 feet in it as in a tunnel. The wood is similar in general character to the Coast Sequoia, or common Redwood, straight in grain, slitting freely, even enough in grain for furniture, and far superior to Oak in its keeping qualities in positions exposed to alternations of moisture. The Sierra Sequoia does not throw up sprouts from its stump as does the Redwood, and can, therefore, be felled out more readily. It was wise in Congress to make a reservation for pleasure purposes of the Mariposa Grove, which is near Yosemite, small and conveniently accessible to tourists by the present routes of travel; but the Tulare-Fresno forest—it is all in those two counties—cannot be converted into a public reservation. Numerous saw-mills will be built on its line, and flumes will carry the lumber down to the consumers.—"San Francisco Alta."

Jones' Method of Drying Fruit.—This was spoken of as having been exhibited in operation at the Cincinnati Exposition during the past autumn, and attracted much attention. It is the invention of Jones Brothers, of Centreville, Mich. One of these establishments is in operation at Grand Rapids, Mich., as well as one on the Alden principle, which is owned by the same proprietors, who say that the Jones plan is in some respects superior to the other, but being new it requires some little improvement, and they defer giving a decided preference until after further trial. It differs from the Alden method in having the heated chamber in a horizontal position, the fruit being placed on revolving racks, and the work of putting in and taking out all done on one floor, thus avoiding the necessity of a three-story building, and the journey up and down stairs required for the Alden method. But, on the other hand, the Jones apparatus requires a small steam engine, or other power, to drive the fan which keeps the heated air in motion, and causes rapid evaporation. In large establishments the steam power is also used for driving the paring and slicing machines, and for making Apple jelly out of the cores and seeds.—"Cultivator."

The late Mr. Buckley.—We are glad to find that Messrs. Rollisson have taken up the cause of the late Mr. Buckley's family, who have been left almost destitute, and have organised a committee to obtain subscriptions on their behalf. Let us, therefore, hope that their efforts may meet with that encouragement which they deserve. Contributions may, in the meantime, be sent to Messrs. Rollisson & Sons, Upper Tooting.

NOTES AND QUESTIONS—VARIOUS.

[Many notes and answers, obligingly sent us by correspondents, are unavoidably omitted this week from want of room.]

Water Convolvulus.—Can any of your readers tell me to what plant this name refers?—INTERNATIONAL.

Sowing Scotch Fir Seeds.—Your correspondent "Hortus" (see p. 102) may sow his Scotch Fir seeds on well pulverised ground early in April, covering them with $\frac{1}{2}$ inch of fine soil. Should drought set in cover with mats or litter, rather than water, until the seeds are up.—J. BELL, *Strathfieldsaye*.

Early Louise Peach.—Allow me to supplement Mr. Lumsden's note (see p. 170) by recommending Early Louise as the best early Peach with which I am acquainted; and it is equally well adapted for outdoor growth or for forcing. I gathered a fine dish of it on the 28th July, last year, from a tree growing on a west wall.—W. WILDSMITH, *Heckfield*.

Amies' Chemical Manures.—This has been tried extensively at Chiswick during the past season, and with satisfactory results. It may be used with perfect safety even in the case of the most delicate kinds of plants, either as a top-dressing or mixed with the soil, while such plants as Fuchsias and Pelargoniums are greatly benefited by its application. It has also been used for Potatoes in the open ground with the best results.

Out-door Grapes in Scotland.—"J. S. W.'s" remarks on Grape growing in the open air, induces me to say that I, too, have seen Grapes growing in the open air in the south-western district of Kirkcudbrightshire, and in Renfrewshire. In both places, the Vines were growing on the walls of bakehouses. Those grown in Kirkcudbrightshire were quite equal to some that I have seen imported. But those grown in Renfrewshire were not so good.—WM. LAURIE, *Alva*.

Water-proof Cement for Stokeholes.—In reference to sunken boilers, allow me to say that a dry stokehole, even if the water is 4 feet around the outside of it, may be secured by the use of cement all round and underneath, so as to prevent the water from rising up through the floor. This, to some, may appear to be impracticable, but experience proves that it is not. I have kept water out by means of my cement again and again, and without the uncertainty attending the use of puddle.—JAS. PULHAM, *Broxbourne*.

Gas Boiler for a Conservatory.—Can any of your correspondents tell me what the relative cost is of heating a conservatory by gas and by a slow combustion stove? Say, for example, a boiler and 100 feet of piping are to be kept at any given heat for twenty-four hours, what would the cost be of the coal and coke in the one case and the gas in the other? Of course the gas boiler would lead to a saving in labour, but this need not be calculated in answering the question. What is the best kind of gas boiler for a conservatory?—ECONOMIST.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

FRUIT-TREE PROTECTION.

THE question as to whether it is desirable or not to afford protection to fruit-tree blossoms may be said to have been settled in the affirmative. From March to May we have sunshine and cloud alternately, frost at night, and heat in the day-time, the latter inducing blossoms to expand, the former ever ready to nip them, even in the bud. The flowering season this year is late, and, so far, favourable; for the later the blossoms, the greater the probability of a crop. Still, we are yet in the midst of danger; for, let but a few bright genial days come on the heels of the cold weather which we have had, and blossoms will open, as if by magic, giving free access to frost. It is imprudent, therefore, to leave Peaches and Nectarines unprotected; and, having determined to save the blossoms, the main questions for consideration are, when and how are we to do this? As to the first, we answer—Now, at the latest. The buds are just on the eve of opening, and, as they open, they need protection, not before. During thirty years' experience, we have never known closed blossoms of stone-fruit to be seriously injured by frost. As regards protection, however, a difficulty arises; semi-opaque or opaque substances—those most impervious to light—are also those least penetrable by cold. Hence the thicker, and, we may add, the rougher a substance is, the more powerfully it protects. But blossoms must have light: shut that out, and we weaken them as well as injure the health of the trees. Hence the most perfect protectors are those which exclude most cold, most effectually prevent the escape of heat, and which cast least shadow on the trees. Glass only, or some semi-transparent substance fulfils these conditions; but glass is expensive, and, unless we are prepared to convert our walls into glass cases for a month or two every spring, some means must be found by which only as much glass as will save the crop, and no more, shall be used. This problem is now in a fair way of being solved; for experience has shown us that glass copings, 18 inches wide, resting on iron brackets immediately under the copings of the walls, are practically frost-proof, or at least sufficiently so to save the blossom-buds from the effects of from 10° to 15° of frost. Of course, the thickness of the glass plays an important part in the matter; and, therefore, rough plate, 28 oz. or 30 oz. to the foot, will be found to be the best, and, perhaps, in the end, the cheapest. The protecting power of this, however, as well as of all copings, is much increased by the blossoms being dry, as it is well known that dry blossoms will resist far more frost than those that are wet. Given, the same trees in the same position and the same amount of frost, one set being wet and the other dry, and the wet ones would have every blossom-bud frozen to death, while the dry ones would escape. Now, protections consisting of thin canvas, frigi domo, and even Russian mats, are not waterproof; but straw mats, so effectually used on the Continent, are so arranged as to keep out rain, and hence, no doubt, to a great extent, their efficiency. As to glass copings, their position is most favourable for protecting the trees from cold. Gardeners have an opinion, very full of meaning, that frost falls in straight lines, or rather, that the radiation of heat proceeds in all directions in straight lines, and that the process continues as long as there is a disparity of heat between any two contiguous bodies. The losing of heat, however, by means of radiation is not absolute, except in one direction, and that is upwards on cloudless nights. The sky absorbs heat so greedily that it takes all from the blossoms and gives none back; hence the danger of injury from frost. But suppose we shut this open door, by means of a wooden coping of sufficient width, the blossoms will retain their heat, and the sky receive none in that direction. Heat, of course, is radiated at right angles to the wall, as well as straight up; but it is also radiated back along these lines from surrounding objects, and the process thus becomes one of reciprocity—not one of taking all and giving back none, as is the case when it is allowed to escape skywards. Check this upward loss, and we save our blossom-buds and secure a

crop. Nature frequently checks it for us by the intervention of clouds, which help in some measure to keep our fruit-buds from perishing. Wooden copings have been advertised, and, doubtless, portable boards are amongst the best of all protectors. They are rain-proof like glass, and they are also proof against radiation, which glass is not, but their shadow proves injurious. They were tried last year in competition with glass, and whilst the latter saved the blossoms, without injuring the trees, the former partially blanched the branches, and even the fruit near the top of the wall. In fact, one of the greatest dangers pertaining to protecting materials is carrying their use to excess. Even glass copings may be applied too soon and kept on too late. We knew a case in which, to save the trouble of applying portable protection, a permanent slate coping, 15 inches wide, was placed on a wall immediately under the ordinary coping. While the trees were young no ill effects were observable, but when they began to cover the wall they also began to get into bad health, and, notwithstanding frequent washings and refreshings from the garden-engine, they missed the dews and the free sweep of the fresh air so much that the slates had to be removed. Therefore, even glass copings should be dispensed with as soon as all danger from frost is over, and, if carefully applied only when the blossoms expand, and stowed away dry when done with, they will last for thirty or forty years. Pyramidal Pears and standard Plums also need protection in some localities; and one of the simplest means of doing this is to suspend straw or Russian mats over them on stout poles. Another mode is to tie a few sprayey branches of shrubs or Firs or Pine trees over and among the branches. Some also wind a few roughly-twisted straw bands loosely round, and among, their trees—a somewhat unsightly plan, but anything is better than the loss of a crop. One of the best means of securing fruit on Pear trees in the form of pyramids or cordons, in average seasons, is to defer pruning them until March. This keeps the blooms abnormally late, and gives them a better chance of setting properly, after the most severe of the spring frosts have passed away. One great advantage of growing cordon Pear, Plum, and other fruit trees, is the facility afforded by their form and size for the most perfect protection. A row of Plum cordons last year had a few boughs of Spruce Fir tied along each, a protection that enabled them to set a capital crop, without further trouble, while every bloom on standard trees close by was cut off by one severe frost, about the middle of May. Plums will bear, swell, and finish remarkably well as ground cordons, 15 or 18 inches from the surface of the soil.

PRESERVED FRUITS AND VEGETABLES.

It is probable that we shall never do much in the way of preserving fruits and vegetables in this country, because our population is so far in excess of our cultivated land that we shall never have either fruits or vegetables to spare for that purpose; our supplies of both must, therefore, be derived from the Continent and the United States. Either fruit or vegetables can be raised far cheaper in America than here at home, because land is there cheaper, and is cultivated in a much more extensive manner, and the produce thus raised, although, perhaps, inferior in point of flavour, is, when preserved, quite as nutritious as that of home growth, and is at any time available for use, while the price is within the means of all. We are glad to see the prejudice against preserved food of various kinds rapidly wearing out, and we see no reason why the choice fruits of tropical climates, such as Bananas, Litchis, Mangoes, Guavas, Kumquats, and many others, should not find their way to our tables in a well-preserved state. We have only to look in the windows of our principal Italian warehouses to see the rapid increase there is just now in the number of preserved fruits and vegetables; and yet it is curious to note how fastidious many are with regard to some preserved fruits, while they eat others almost unconsciously. A good housewife once gave us a look of withering scorn when we mentioned canned Tomatoes; yet all her life, in common with thousands more, she had used dried Grapes (Raisins), Orange-peel, Figs, Prunes, and yearly was one of the most careful of all preservers of home-grown fruit; indeed, her home-made Orange

marmalade, Strawberry jam, Cherries in brandy, and Red Currant jelly, are things we never found excelled in flavour, and yet the prejudice against "new-fangled notions" prevailed. In preserving fruits, cans or tins should never be used if glass or earthenware can be obtained, as the acids decompose the soldering material employed, and the result is the production of highly injurious, if not actually poisonous, salts. Wide-mouthed glass bottles or jars are largely employed in nearly every American household, and are furnished with metallic lids, which screw down perfectly air-tight over an indiarubber washer or ring. Even for the ordinary purposes of jam-making, these ought to find a very large sale in this country, as they are handy and do away with the trouble of oiled papers or bladders, and can at any time be opened, while the state of their contents is always apparent without any unfastening whatever. The beautiful crystallised or candied fruits, now so common in our shop windows, are for the most part of Continental origin. These consist of Plums, especially Prunes and Green Gages, Figs, Pears, Apricots, slices of Pine-apple and Melons, and a few fine Currants. The majority of these are crystallised whole, and are then packed very tastefully in ornamental boxes of various sizes suitable for Christmas, and other presents; and in this form, they sell readily and fetch excellent prices. It has often appeared to me a very singular thing that while during two or three months of the year we have Plums, Cherries, and choice Pears in abundance, and cheap, yet we never adopt any means to preserve them in a form fit for the winter's dessert. Tons of cheap, and, we might add, in many cases, nasty fruit, are sent off yearly from Covent Garden and other metropolitan markets, for jam-making purposes, but so far as the art of fruit-preserving, in its best forms, is concerned, we may be said to know but little, and to practice still less. The Chinese preserve many of their finest fruits, including the Apricot and different forms of the common Orange, all of which form agreeable conserves. The Chinese Kumquat or "Coumquat" is now largely imported, and a large jar of this preserved fruit may now be obtained for a few shillings. A large trade is also done by the Chinese in preserved or candied ginger, which is not a fruit, but the fleshy rhizome of a plant (*Zingiber officinale*) commonly grown in most tropical countries. Apart, however, from the supply sent over from China and the West Indian Islands, in a candied state, large consignments of the fresh roots now arrive annually in this country, and these are sold at prices varying from 1s. to 1s. 6d. per lb. Apart from home-grown produce and the Continental and Chinese productions, however, a very extensive trade has quite recently sprung up in canned goods from the American States. Of the fruits and vegetables sent over in cans the most important are Tomatoes, Cranberries, Peaches, Pears, Pine-apples, Asparagus, and fresh Indian Corn, and in nearly every case these are of good quality, and as nutritious as the newly-gathered productions themselves. The canned Tomatoes I have repeatedly used, and few fruits are more palatable, especially during hot summer weather; but, of course, the canned fruit is not expected to supersede fresh fruit, but merely to be a most excellent substitute for it at a time when it would otherwise be unattainable. Among the newer methods of preserving fruits and vegetables we must not forget the drying or dessicating process, now largely employed in America and elsewhere. The principle in this system consists in evaporating the water from the tissues, leaving the sugar, starch, and other nutritious portions of the fruit in a dry and more portable form, better adapted for use during the winter months or in unproductive seasons. In New York and New Jersey States different modifications of the drying process are being extensively worked, and we have already samples of dried Apples, Pears, and mixed vegetables and herbs for soups, in the market. In some of our country districts Mushrooms are dried for the last-mentioned purpose, and are found to retain their delicate flavour remarkably well; and, where pickled Mushrooms or Catsup is not obtainable, they are a worthy substitute. A new industry has also been opened up in the Western States and California, where the Grape Vine fruits well, for its produce is now utilised for raisins, some of which are sent annually to the English and Continental markets.

B.

NOTES OF THE WEEK.

— MR. MAW informs us that *Crocus minimus* (D. C.), *C. insularis* (Gay), has just flowered at Benthall Hall. It is a lovely little species, roots of which he obtained in April, 1870, in the neighbourhood of Ajaccio.

— IN Mr. Ladd's nursery, at Bexley Heath, there are many houses for forcing Roses, most of which are very large, the latest put up being a fine light house, 300 feet long by 25 feet wide. We have seen many large houses used for forcing Roses in America, where Tea Roses are in great demand in winter and spring; but never anything like this. It now contains what may be described as a meadow of Roses, *Niphetos* in the centre and General Jacqueminot around the side. These are now blooming abundantly, and the half-opened flowers are cut by thousands every evening.

— THE beautiful *Iris reticulata* is now a very conspicuous object in the York Nurseries. It is placed under a south wall, the pots in which it is growing being plunged in ashes, where they have been throughout the winter, and where they have received no artificial protection whatever. Nevertheless, it is now a sheet of blue, and along with it is a variety, with purple flowers, named *Iris reticulata* var. *purpurea*. We have received fresh flowers of this and the ordinary blue kind from Mr. T. Ware; and both are so beautiful, either in pots or as cut flowers, that they deserve to be extensively grown.

— *MASDEVALLIA LINDENI* is now finely in bloom in the Victoria Nurseries, Holloway. It has twenty-five expanded flowers of a brilliant magenta colour, and many others that will open before long. It is one of the finest of the genus, and continues a long time in bloom, which makes it a valuable acquisition. The particular specimen referred to here is the largest in Europe. The beautiful *Tillandsia Lindenii*, bearing splendid cobalt-blue flowers, with a pure white eye, is also blooming at the same place. It has three flower-spikes, from each of which it throws up its beautiful blossoms one after another; as fast as one fades another appears just above it.

— WE are requested by the Royal Horticultural Society to state that, in consequence of the representations made by several of its regular exhibitors (particularly of florists' flowers), the Council have determined to hold all the exhibitions as originally advertised in the schedule for 1875; but that, to carry out the reduction of expenditure, suggested in their advertisement in the gardening papers of the 18th and 20th February last, by striking off the list the exhibitions of the 17th March, 21st April, 1st September, and 10th November, 50 per cent. of all the several prizes offered in the schedule must be deducted, leaving the values of the "medals" as they were.

— ON Wednesday evening last a lecture was delivered in the Council-room of the Royal Horticultural Society, at South Kensington, by the secretary, Mr. W. A. Lindsay, on the "History and Progress of the Royal Horticultural Society." The lecturer graphically alluded to the formation of the Society, and the immense impetus which, in days gone by, it gave to horticulture in this country as well as abroad. Between 1815 and 1823, the Society sent Mr. G. Don to the West Indies as a collector of plants, Mr. Forbes to East Africa, Mr. Parkes to China, and, in 1823, Douglas was sent to North America, and, as is well known, introduced from that quarter many of the most beautiful Conifers now in our gardens. In 1825 it was determined to make meteorological observations at Chiswick, and they have been continued ever since, thus forming one of the most valuable weather-reports on record. Apart from the culture and introduction of new plants, however, the Society published much valuable information in its "Transactions," a publication which alone is said to have cost nearly £40,000. The establishment of horticultural exhibitions at Chiswick, on an extensive scale, contributed much to the Society's popularity at a time when flower shows were comparatively unknown in this country. As a proof that financial difficulties are nothing new to the Society, the lecturer remarked that, when Mr. Sabine resigned and Mr. Benthall succeeded him in the capacity of secretary, the Society owed no less than £20,243—a sum which was cleared off by increasing the subscriptions of the Fellows, and by the fêtes which then proved so successful. In conclusion, the lecturer drew attention to the terms under which the Chiswick Garden was held, and lamented the policy which induced the Fellows to part with so much valuable property, which they had the power of holding, on a perpetually renewable lease, at a mere nominal annual rental. In conclusion, a hope was expressed that the Society would again regain a prosperous position, and that it would in the future continue the good work which it had already done so well in times past.

THE HEMP AS A GARDEN PLANT.

(CANNABIS SATIVUS.)

THIS well-known annual is a native of India and Persia, and is largely cultivated in Europe for the sake of its fibre. In ordinary situations it grows from 4 to 10 feet high, but in Italy, under very favourable circumstances, it sometimes grows as high as 20 feet. In plants growing singly the stem is frequently much branched, but when grown in masses it is generally straight and unbranched. The leaves are long-stalked, and composed of from five to seven long, lance-shaped, sharp-pointed leaflets, radiating from the top of the stalk, and with the margins cut into sharp saw-like teeth. The flowers are of separate sexes on different plants, the males being produced in racemes and generally crowded together towards the top of the plant or ends of the branches, having a five-parted calyx and five stamens; the females are in short spikes, their calyx consisting merely of a single sepal, rolled round the ovary, but open on one side, and they have two hairy stigmas. The fruit (commonly known as "Hemp seed") is a small, greyish-coloured, smooth, shining nut, containing a single oily seed. Hemp was known in Europe in very early times, for Herodotus, writing upwards of 2,000 years ago, mentions it as being cultivated by the Scythians, who used its fibre for making their garments. This plant is useful where the tenderer sub-tropical plants cannot be enjoyed. Single well-grown plants of it look very imposing and distinct, and are good for the backs of borders or mixed groups. For these purposes, it should be sown early in April in the open ground. To get large plants it would, no doubt, be worth while raising it in frames. It loves a warm, sandy loam. Russia and Poland are the two great hemp-producing countries, and it is from them that our supply is mainly derived; but the best product is from Italy. The United States and India likewise send Hemp to this country, but the quality is inferior to the Russian. The harvesting takes place at two periods: the male being pulled up as soon as it has done flowering, and the female not until the seeds are ripe. After pulling, the leaves are struck off with a wooden implement; the stems are then tied in bundles and steeped in water, or water "retted," as it is technically termed (two other processes, dew-retting and snow-retting, are sometimes substituted), the object being to loosen the fibre; they are then spread out to dry and bleach: this is called "grassing," after which the fibre is detached, either by pulling it off by manual labour, or by breaking the stems in a machine, and afterwards scutching them in a similar manner to that employed for the preparation of Flax. The uses of Hemp for the manufacture of cordage, canvas, &c., are too well known to require comment.

The Effect of Transplantation in Averting Damage by Frost.—This has been well illustrated by a case which occurred at Feltham, where a quarter of an acre of ground was sown last spring with scarlet Queen Stock, with the intention that the plants, duly thinned, should remain to flower. The thinnings were planted out during the summer upon the ground close by, and grew into strong plants, though not so large as those that remained in the seed-bed. Over three-fourths of the untransplanted ones are now entirely killed, whilst of those transplanted scarcely one is injured.—"Florist."

THE INDOOR GARDEN.

PROPAGATION AND CULTURE OF THE CARNATION.

THERE are a great many fine varieties of Carnations, and the colours and markings of the flowers of many of them are exquisitely arranged and brought out. In some the blooms are small, in others massive, but all are beautiful and interesting. My first favourite is the old cerise-coloured Clove, the flowers of which are all of one colour, of perfect form, of an agreeable spice scent, and worthy of being grown largely, as it is in many places. Souvenir de la Malmaison is a very common sort, which bears large flesh-coloured flowers, highly fragrant, and useful for house and pot cultivation. Mr. Young, of South Bridge, Edinburgh, has lately raised a seedling

from this variety, which possesses all the good qualities of its parent, but the petals are distinctly striped with deep rose, which places it amongst the Bizarres—a term applied when the flower is striped and of a light and dark colour. Duke of Wellington, Perfection, and many more are of the same class. The blooms of Oscar are nearly yellow, and Queen of Whites is the best white. Scarlets are very plentiful, and are best represented by Boule de Feu, Beauty, Dragon, &c. Most of the named varieties are very good, with their markings well defined and describable, but many of those which a packet of selected seed will produce are equally good and as pretty. Sometimes the progeny surpasses in form and rich markings the variety from which the seed was saved. They are as extensively cultivated in pots for greenhouse and conservatory decoration as they are in beds and borders; but, as the treatment differs somewhat in the two cases, perhaps it will be convenient to consider the two separately.

Indoor Culture.

To have a succession of bloom all the year round, one batch of plants must be prepared throughout the summer to flower in the winter and spring; another batch must be prepared during the winter and spring to bloom in the summer and autumn. Plants which have been flowering throughout the winter will have made sufficient growth to afford a quantity of cuttings at this time, which may be taken off in the usual way, selecting, of course, such shoots as are most likely to form the best and

strongest plants. The lower leaves should be closely cut away with a sharp knife, until a clean stem of two inches is cleared to insert into the rooting material, which should consist of equal proportions of loam, river sand, and leaf mould. Six cuttings may be put round the edge of a 5-inch pot; when put in the centre they do not root so freely, and the pot containing the cuttings must be plunged in a bottom-heat of 70°, and kept there until they are rooted, when they may be potted singly into 3-inch pots, using a mixture in which well-rotted dung is substituted for the leaf soil. They must then be set in a close atmosphere, with a temperature of 50°, until they begin to push into the new soil, when air is gradually admitted until they are fully exposed. I have seen them planted out about the end of April, and grown during the summer in a well-prepared piece of ground until autumn, when they were lifted, and potted into whatever sized pots their growth required. I think, however, they always flower more pro-



Male and Female Hemp Plants.

fusely when grown altogether in pots, and not planted out at all. In pots they need more attention in hot weather to prevent them suffering from drought, but the extra bloom they produce in winter compensates for all this. When grown in pots they should, when necessary, be shifted into larger sizes during the summer, but they should not be potted after the middle of August, or they may not be in that partially pot-bound condition, which is always conducive to flowering about November. Almost any position is suitable for setting them in throughout the summer. When the pots are plunged in coal ashes labour in watering may be saved to a certain extent. That the blooms may open perfectly, the plants should be fully exposed to the light during the winter, and watering with manure-water now and again greatly assists in sustaining the vigour of the plant and blooms. To form a succession to these plants, cuttings prepared in August will root then in a close shaded frame, with no bottom-heat. A 3-inch pot should be used at this time, and one cutting should be put firmly into the centre of it, where it roots freely, and forms a ball, which need not be disturbed when shifting into a 5-inch pot. This size should not be exceeded in autumn, or much care is needed to prevent the soil from becoming sour during the period of short days and long nights. Half the plants should be retained in the 5-inch pots, to flower in the early part of the summer, and the other half can be potted into 7-inch and 8-inch pots to bloom in autumn. Old plants, when they have finished flowering, are sometimes re-potted and kept on for flowering the following season, but these never turn out so well as fresh young plants, and as these can be so easily propagated and grown I always recommend them. Close attention must be paid to staking and tying the leading shoot, and the side flower-spikes should also be staked well out, so as to have the flowers as well arranged as possible. If large individual blooms are wanted the buds should all be thinned off except two on each spike; and, if for exhibition purposes, the spikes may be reduced also.

Out-door Culture.

Layering is the best mode of propagating Carnations when grown in beds; but the operation requires to be performed with some nicety. At the end of July or beginning of August, a quantity of light matter, consisting chiefly of leaf mould and sand, should be got ready; and a dressing of this, about 2 inches thick, must be laid round each plant. The layers are rooted in this, therefore the compost should be sufficient to embrace them all. The shoots intended to be layered should then be selected, and should be divested of their leaves, so as to leave a few inches of their stems bare. A split, extending through two joints of the bare stem, must then be carefully and evenly made up the centre of the shoot. This leaves one-half of the stem attached to the old plant, and the other half protruding like a small tongue, which must be pressed out so that the edges of the cut part may rest in the soil. It is necessary to place a peg close to the base of the layer, so as to keep it in position. Another spadeful or two of the mixed material must then be placed above the other, so as to cover all up to the bottom leaves of the layers, and a good watering should be given; after which no more attention is needed until they are well rooted. Some plants will supply a dozen or more shoots suitable for layering, which is not too many; while others may not have more than one or two. Pegs made from the common Bracken (*Pteris aquilina*) are the best I have used for pegging them with, and they decay quickly in the soil when no longer required. As soon as the young plants are rooted sufficiently to lift with plenty of ball, the stem which unites the young plant with the old must be cut with a knife. When lifted, they should be planted 6 inches apart each way, in a cold frame, in which some sandy soil has previously been placed to the depth of 4 inches. They must be kept close for a few days after being newly put in; but, when established, full air may be given them, excepting in wet or frosty weather, when they should be protected. During damp weather, mildew sometimes attacks them; and this has to be exterminated by sprinkling sulphur over the affected parts. Little water is needed at the root throughout the winter, and decayed leaves should be clipped, but not pulled; for, being very tough, the stem is frequently injured, and the roots disturbed in this way. If bad weather necessitates their being kept close during winter, they must be well exposed before being planted out, or they will be shy in starting into growth. Beds or borders intended for their reception should be manured with strong dung and deeply dug in autumn. About the end of March the surface should be stirred up and well broken with a fork; and, if the soil be dry enough, the young plants may be brought from the frame with balls intact, and planted out about the 1st of April. The soil must be firmly pressed about the roots; and, if cold cutting winds prevail afterwards, a few Spruce branches inserted in the bed here and there amongst the plants help greatly to protect them. The soil must be kept clear of weeds in summer, and the only attention the plants stand in need of when in full growth

is staking and tying the flower-spikes. If neglected in this respect they are very liable to get broken, as the stems are small and brittle, and the blooms large and heavy. What I have said regarding the Carnation is applicable to Pinks and Picotees; the latter name has arisen from the marking in the flowers, and the only difference which I know of in Pinks is that they require to be layered about a month earlier than the Carnation; and, instead of being kept in frames during the winter, they should be planted in September into the position they are intended to adorn the following season.

J. MUIR.

FORCING THE LAURUSTINUS.

Two of the most conspicuous objects in our greenhouse this winter have been two tall standard plants of *Laurustinus*. They have been grown in pots for several years, and stand upon the terrace during the summer, in a somewhat warm situation, where they make quite a profusion of flower-buds before autumn. By November they are moved into the greenhouse; and before Christmas, when the buds are just ready to open, they are again moved into one of the Vineries, where all the flowers open simultaneously, and, when seen through the glass at a short distance off, the plants might easily be mistaken for a well-flowered white *Ixora*. Outdoors, in the northern counties, except in certain situations near the sea, the *Laurustinus* never opens its flowers perfectly; or rather, I should say, the flowers on each truss seldom open altogether—some are fading while others are just expanding, which gives the head a weedy look, and renders them unsuitable for button-holes and bouquets. When forced in a slight heat just about mid-winter, the flowers, on the contrary, open freely, and have a pure white aspect, not surpassed by that of the *Camellia*, and the truss, being graceful in form, is most eligible for cutting for any purpose. A single truss backed up by its own foliage, a *Geranium* leaf, or a sprig of Maiden-hair Fern, is much esteemed for button-holes. As soon as the flowers are fairly out, we move the plants into a cool house, where they are available for cutting for about two months. It is not necessary that the plants should be grown as standards. Little plants from the borders, potted in spring, and grown in a warm situation during the summer, would do equally well, and perhaps be more generally useful for furnishing. Such plants may always be had cheap from the nursery; in fact, we have sometimes wondered that nurserymen did not make the pot culture of this plant a speciality. Of course, even young plants set their flowers freely when planted out; but, when grown in pots, they make a much denser bush, and the flower-trusses are much more numerous. We have no hesitation in advising those who require a supply of pretty white flowers during the autumn, winter, and spring months, and who desire to produce them cheaply and with certainty, to grow *Laurustinus* in pots.—“The Gardener.”

Chinese Primula Blooms Damping Off.—I would invite all growers of *Primula*, and amateurs especially, to keep a sharp look-out during damp weather for the first symptoms of that destructive mould that will, if unseen, soon destroy the finest heads of bloom. The mischief invariably commences in the tube of the flower, and is doubtless caused by moisture having settled there. Soon the flower droops and rots, and is somewhat negligently pulled away without thought as to after results. In the meantime, the mouldy virus is creeping gently down the flower-stem, until it reaches the base of the truss, from whence all the other flower-stems radiate; here it spreads rapidly over the whole stem, and, in a few days, the entire truss collapses, much to the disappointment of the grower. I have often seen the same thing occur in the case of a fine head of seed pods, and that too after much labour had been expended in the hybridisation of the flowers. The only possible remedy is to frequently look over the flower-stems on each plant, and, if any signs of damping are apparent, pinch them off clean below the affected part. Sometimes, too, when the rot has reached the base of the truss, I have saved the flowers by carefully cutting away the decayed part with a penknife.—A. D.

A Grove of Gardenias in England.—Good gardeners have so long grown *Gardenias* well in pots that probably few will expect much improvement in the cultivation of these plants. Mr. Philip Ladd, of Bexley Heath, however, has shown even more than his usual boldness and intelligence in dealing with *Gardenias*, and we have never seen a more interesting subject in its way than his *Gardenia-house*. This is about 140 feet long by 25 wide, and wholly occupied by *Gardenias*, healthy glossy bushes dotted over everywhere with their large and handsome green and white buds. The bushes are all planted out each on a mound of peaty soil, which rests on the hard floor of the house. Each plant stands on a hillock, and thus water may be abundantly used without injury. They do not root into the floor, but each bush finds its nutriment in

the barrowful of soil or so in which it is planted; with plenty of heat and moisture, and frequent syringing, the plants grow apace, and there is no mealy bug—their usual attendant and enemy—to be seen. On the floor and around the mounds the water lies in pools, as it might in a bog. The effect afforded by the bushes is like that of a healthy Coffee plantation, though, by and bye, when the white waxy blossoms are opening freely, it will be very different. This and other plantations made by Mr. Ladd seem to point to the probability that much improvement may be effected by planting out subjects now usually grown in pots.—W. R.

When to Sow Mignonette.—I have bought some seed of what is called Tanton's "New Prize Taker" Mignonette, and will feel obliged by some instructions as to when it should be sown.—AMATEUR. [Mr. Tanton says:—"For summer work sow in February in slight heat, and grow the young plants on in a warm light plant-house. For autumn and winter decoration, sow in March and April, in small 60-sized pots, three seeds being put in each pot triangularly; place the pots in a cool situation until the young plants are in the rough leaf; then remove all but one, and place the pots in full sunshine; as soon as the pots are full of roots, re-pot into pots larger in size, using as compost one-third turf and loam, one leaf mould, one road grit, well draining the pots, and staking the plant. As the side shoots progress, keep them pinched back in the same way as a Geranium, in order to make them vigorous and strong. During June, July, and August they should be kept in a situation with a north aspect, and should be sprinkled overhead; they will then have acquired sufficient size to be removed to a more sunny and open situation. The last stopping may be made the first or second week in September, when they may be exposed to the full rays of the sun in order to ripen the wood and set the bloom for the winter months. Early in October they should be placed in a cool airy greenhouse, close to the light, when the flowers will expand and continue to do so throughout the winter and spring months."]

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Two Varieties of Camellia Valtevareda.—With reference to "N. H. P.'s" note regarding this Camellia, purchasers should be informed that there are two varieties of it, one of which is much inferior to the other and seldom properly expands its flowers. Care should, therefore, be taken to secure the best variety.—W. H.

Orchids Now Open in the Exeter Nursery.—The following are at present in fine condition with us, viz.:—*Phalenopsis Schilleriana*, *P. amabilis*, and *P. grandiflora*; *Odontoglossum Pescatorei*, *O. nebulosum*, *O. Bictonense*, *O. Uro-Skinneri*, and *O. citrosum*; *Zygopetalum Mackayi*, *Lycaste Skinneri*, *Oncidium incurvum*, *Cypripedium barbatum* and *insigne*, *Dendrobium nobile*, *D. Dalbousianum*, *D. moniliforme*, and *D. speciosum*.—Wm. R. W. WOODMAN, *Exeter*.

Planting out large Camellias.—The present is the best time to plant out large Camellias. Before doing so, the old inert soil should be carefully picked out with a stick, or some sharp-pointed instrument, taking care at the same time not to injure the roots. Drain with broken bricks, and give 3 feet of good rough loam and peat in equal proportions. In this they will revel. After planting, give a good soaking of water to settle the soil.—J. SHEPPARD, *Woolverstone Park*.

New "Strain" of Chinese Primulas.—Mr. James, of Isleworth, has now in bloom a distinct strain of the Chinese Primula, raised from seed taken from Tomkin's Marquis of Lorne. The plants have remarkably close-set, compact foliage, the leaf-stalks, being much shorter than those of other kinds; the foliage thus forms a bouquet-like setting, out of which the heads of bloom just rise, and form a complete rounded cluster, only a few inches in height. The blooms are large and of good substance, and of a deep rosy-purple hue.—A. D.

Begonia Lapeyrouse.—This is an excellent winter-flowering sort, bushy and short-jointed. Its pale pink flowers are produced in great profusion during the winter months. Plants of it, raised from cuttings struck in spring or early summer, and grown on in a close, warm frame, or pit, till autumn, are more generally useful than older plants, especially for indoor decoration, for which purpose it is admirably adapted. It, like all the Begonias, succeeds best in a light, rich, and free compost, with good drainage, and is impatient of too much moisture in the dull days of winter.—J. E.

Aloe ciliaris.—This is a useful plant in greenhouses as a small climber, and one which ought to be better known than it is. It is slender in habit, and easily trained into all kinds of positions. Its graceful spikes of yellow and orange flowers are produced freely from January to March, and at intervals during other periods of the year. They vary from 2 to 4 inches long, and are set on foot-stalks from 6 to 8 inches. It grows freely in almost any soil, but flowers best if well exposed. If planted out it will often grow from 5 to 6 feet in a season, and will push freely if cut back.—J. CROUCHER, *Hammersmith*.

New Camellias.—The Jardin d'Hiver is one of those newer Continental kinds that are not as yet common in gardens, but it is one that is highly commendable on account of its compact pyramidal habit. It is free flowering, and produces fine large imbricated dark rose flowers. It has a habit quite distinct from all other kinds I am acquainted with, and anyone adding it to their collection of Camellias will, I am sure, be pleased with it. I think it is one of M. Ambroise Verschaffel's raising or sending out, as he sent it me amongst a large collection I commenced forming here a few years ago. General Cialdini is another beautiful imbricated flower, of perfect form, and a highly commendable kind of a bright carmine colour. It bears cutting, and buds freely. Matteo Malin is also a lovely variety; in colour it is cerise, with a white mark down the petal. This is really a most beautifully chaste flower, of perfect form, and no collection should be without it.—CHEVALIER.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Kitchen Garden.—In this department a continuous supply through the season much depends upon the attention during the next few weeks in putting into the ground the numerous seeds that require it. The whole of the Potato planting should be brought to a close before the end of the month. If the seed has been prepared as advised some weeks back, it will be in good order. In planting the general crop, there are two courses to follow: either place the rows sufficiently far apart to admit of winter Broccoli, Cabbage, Brussels Sprouts, &c., being afterwards planted between the rows; or put the Potatoes far enough apart to ensure their well-being, without anything else between them. In the former case, the rows will require to be a yard asunder; in the latter, 2 feet to 2 feet 3 inches will be sufficient. I prefer the single-cropping system, as, when double-cropping is resorted to, the winter vegetables never do so well, and in many cases are too far apart when the Potatoes are removed. On the score of economising space, this double-cropping is evidently more loss than gain.

Sowing Seeds.—Sowings should now also be made of Cocoa-nut and Enfield Market Cabbage, green Curled Savoy, Walcheren and Early Cauliflower, and Veitch's Autumn Giant Cauliflower. Prepare the seeds with red lead, as advised some time back, to protect them from birds. A little Cos and Tom Thumb Lettuce should also be sown. Successional Broad Beans and Peas will now require putting in. Excepting where the vegetable ground is very limited, and there is a difficulty in procuring Pea-sticks, there is nothing to equal the tall Marrow kinds for furnishing a large and continuous supply, which does not come in altogether as the dwarfer-growing varieties do. Where the tall sorts of Peas are grown, and the ground is rich and in good condition, they will require 5 feet 6 inches space between the rows; this will be sufficient, and better than sowing farther apart with Broccoli or Celery between, as is sometimes done; such double cropping being here again no advantage, for the Celery, Broccoli, &c., so grown never has the necessary strength and vigour to withstand the winter that they have when grown by themselves. A row of Spinach can always be grown without any disadvantage between Peas so planted. Amongst winter vegetables there is nothing that is of more real use than Brussels Sprouts. To grow them well, the seed must be sown not later than the third week in March, so as to get the plants a good size early, planting them out where they are ultimately intended to grow as soon as they are large enough.

Onions and Parsley.—The main crop of Onions should be sown as soon as the ground can be got into proper condition. Select for this important vegetable a good open piece of ground that has been deeply trenched in the autumn, and the manure got well down, as this gross-feeding deep-rooted vegetable delights in plenty of manure at a considerable distance below the surface. If there happens to be at hand a good supply of manure from the poultry-house, in a tolerably dry state, an inch of this material scattered over the surface, with an inch of soot, is the best preventive to the attacks of the Onion-grub, in addition to its manurial properties; if it be not sufficiently dry, mix ashes with it; this mixture should be well forked in and mingled thoroughly with 8 or 10 inches of the surface-soil. After the ground has been so prepared, it should have the benefit of three or four dry days before sowing, immediately previous to which tread the surface firm; then with the line mark out the rows a foot apart and half an inch deep. Thoroughly good well-grown Parsley is always acceptable; and here, amongst the Onion crop, without any detriment to the latter, it can be produced in the best possible condition. In every third row of the Onions drop in a few seeds of Parsley, at intervals of 2 or 3 feet; slightly cover the seeds altogether, again treading the whole surface firm, finishing with running the garden-roller over it. Leeks should likewise now be sown—a small patch broad-cast; afterwards transplanting. More Radishes, Mustard, and Cress should be put in—always remembering that, to have these young and tender, sowings must be made at short intervals.

Frames, &c.—Give abundance of air to Cauliflower and Lettuce under hand-lights and frames; as also to Potatoes, Radishes, Carrots, &c., in frames. See that the heat to Cucumbers in dung-beds is kept up by sufficient linings, as any check through an insufficiency of warmth would seriously retard their progress and produce a stunted condition of growth, from which they are slow to recover.

Apricots, Peaches, and Nectarines.—The dull sunless February has had the usual beneficial effect in retarding fruit blossoms, which are a full month later than they were last year. The necessary protecting material for these fruits should at once be got ready, and put on as soon as the first blooms open. All Peach walls should be furnished with moveable copings, the best of which undoubtedly are the permanent iron brackets with moveable sheets of

glass, the only objection to this being its first cost. A very efficient and inexpensive coping may be made of three-quarter-inch Spruce boards; the brackets to support these should be flat wrought iron, an inch-and-a-half wide by half an inch thick; these should pass immediately under the stone coping of the wall, and, to render them more secure, ought to be bent down a couple of inches so as to clip the bricks at the back of the wall. Supposing that the permanent stone coping overhangs the front of the wall 3 inches, these iron brackets should extend 13 inches from the wall and be turned up at their outer extremity three-quarters of an inch, that is, the thickness of the boards. In the middle of this turned-up end, there ought to be a hole, that will admit a small screw, which must be screwed into the front edge of the board to secure it there. The brackets should be bent from the wall at an angle of 35°; the boards used should be 11 inches in width, which will allow of their slipping under the stone coping to a distance of an inch, the angle to which the brackets are bent leaving room for this. The light or heavy character of the shading material used will determine the distance apart of the brackets. In moderately high-lying dry localities, where, in addition to the boards, a light material will be sufficient, the brackets may be 8 or 10 feet apart. In situations of this description, old fishing nets, which can be had in most parts of the country at a 1d. or 1½d. per yard, and which, further on in the season, are very useful in protecting Strawberries, Cherries, &c., from birds, will be ample. These should be tacked to the front edge of the boards sufficiently close to leave no openings, and to prevent the wind blowing them against the trees, which would only do serious harm. They must be secured at the bottom; this can be done by inserting in the ground, 6 feet apart, stakes of the strength of a broom-handle, to which the nets are tied. This protection may, without injury to the trees, remain on from the first opening of the bloom until the fruit is fully set. For situations that are not exceptionally low, damp, and under the influence of more than an ordinary amount of spring frost, it will be found all that is requisite. I have had under such covering a full crop of Peaches and Nectarines during a season when we had 16° of frost, whilst the trees were in bloom; the atmosphere and the trees being quite dry at the time. There are some places so unfavourably situated as to require thicker protecting material than the above, such as stout canvas. Where this is necessary it should be made in lengths of say 25 or 30 feet, fastened with strong tacks to the front of the coping boards, and securely tied to stout stakes driven in the ground at the bottom. A thick covering of this sort, of course, must be removed in the daytime. This can be done by folding it up from the bottom, and laying it on the top of the coping board, where it must be secured by cords, at intervals of 8 or 10 feet, passing round the boards, to which they are nailed back and front; with these cords the canvas must be tied, to prevent its blowing about. A handy man, with a light ladder, will in a short time cover and uncover in this way a wall of considerable length. Heavy coverings of this sort are frequently fixed with rings on wires, top and bottom, to slide as curtains, the objection to which is that, however tight the wires are fixed, even when in short lengths, the weight of the curtains causes them to dip at the top, leaving an opening, through which the wind rushes on to the trees. Heavy coverings of this description will necessitate the supporting brackets being nearer together.

Herbaceous Borders.—Most of the plants here will now be showing above ground. The mulching materials, recommended to be spread on the surface early in the winter, should now be dug in. For this purpose a five-pronged steel digging-fork is preferable to a spade. Even in light soils, an implement of this description may be used. If the margin of the Grass adjoining requires edging-up, let it be done at the same time, so that the whole may look neat. In this spring digging, be particularly careful not to disturb the roots of Lilies of any description, as these plants, more than most others, especially at this season, cannot bear any mutilation of their roots. Shrubbery borders should now be hoed and raked over, so as to give them a clean and tidy appearance.

Houses.—The temperature of the stove should now be raised, keeping it 65°, or a few degrees over, in the night, with a corresponding rise by day; but in the mornings of apparent sunny days, reduce the fire-heat sufficiently early, so as to avoid the necessity of admitting much of the cold cutting air we get at this time of the year. Shade such plants as require it when the sun shines clear, as its effects on the young tender foliage is at this season calculated to do more harm than later on, when the leaves are more fully developed. Supply all the free-rooting quick-growing subjects here with a sufficiency of water at the root. Syringe the plants with tepid water early every afternoon, to keep down thrips and red spider, which the higher temperature will cause to increase apace if not kept in check by this means. In the greenhouse more water

will be required, especially to soft-wooded plants; here also do not admit side air, except in small quantities, when the winds are cold and piercing; but ventilate freely at the roof during the middle of the day. Pot Lilies of all kinds, the moment they show above the soil, should be brought into a light airy situation; keeping them even a very short time after they appear above ground in a dark or only partially lighted place appears to have two effects—it draws the shoots in a way that spoils their appearance, and seems also to curtail the root-forming capabilities of the plants; these weakened drawn stems always being deficient in surface roots—that is, roots from the stems above the bulbs, which these plants, when well grown, throw out in quantity.

THE FLOWER GARDEN.

LILIUM GIGANTEUM AMONG RHODODENDRONS.

My experience of the hardiness of this stately Lily for outdoor cultivation quite confirms that of Professor Owen, detailed in *THE GARDEN* of the 6th inst. (see p. 191). I purchased a small root of it four years ago, and kept it for two years in a cold frame, where it produced small healthy foliage for two successive years, but showed no indication of flowering, nor did it increase much in size. In the autumn of 1872, I planted it out in a bed devoted to American plants, in which the soil consisted mostly of peat, with a slight admixture of loam and leaf mould. In the summer of 1873, it made a vigorous growth of foliage, which was nearly all cut down in the succeeding winter. Last spring, a rich display of foliage was produced from three or four crowns, one of which threw up a strong flowering stem nearly 3 inches in diameter at the base, 7 feet high, and bearing thirteen flowers, all of which ripened seed. During the last year it seems to have quite doubled in size; and now forms a mass of seven or eight crowns, which are commencing to throw up foliage. The plant seems perfectly hardy under a most trying winter. My garden is 600 feet above the sea level, and during the last four months we have had a continual alternation of severe frosts and sudden thaws. The clump of *Lilium giganteum* has had no artificial protection, save a thin sprinkling of Cocoa-nut fibre, but the partial shelter afforded by the *Andromedas*, amongst which my Lilies are planted, has, I doubt not, been effective in sheltering them from excessive summer heat and winter frost. Under such circumstances, I believe the whole of the Lilies would be perfectly hardy in the open air, and an intergrowth of small ornamental evergreens (*Kalmias*, *Andromedas*, *Ledums*, *Heaths*, and small *Rhododendrons*), adds much to the effect of a bed of Lilies, which would otherwise be unsightly, except during a few weeks from June to August. In a mixture of rich peat and leaf mould, strengthened with a little loam, nothing can exceed the vigour with which nearly all the known species of Lily thrive with me in the open air, and the increase in the size of the bulbs is much more rapid than under pot culture. I flowered last year upwards of twenty species in the same bed as that containing *L. giganteum*. *L. pardalinum*, which was a single small bulb two-and-a-half years ago, produced four stems between 7 and 8 feet high, which, collectively, bore eighty-seven blossoms; and *L. Szovitsianum*, twenty-eight flowers on a single stem, *L. umbellatum*, and many other species were equally luxuriant; the only species that did not succeed with me in the open air were *auratum* and the varieties of *speciosum*; but this, I think, was due to the bad condition of the bulbs.

GEO. MAW.

Bentham Hall, Broseley.

TREATMENT OF FUNKIAS.

FROM the scarcity of these plants it may be presumed that few people are aware of their worth for many kinds of decoration. They are all plants possessing handsome leaves, and the flowers being very delicate, both in form and colour, are more like those of some choice tender stove-plant than a hardy herbaceous one. Their requirements, like those of many hardy flowering plants, are few, and they grow to perfection in an ordinary herbaceous border. Their foliage decays in autumn, when, according to the depth they are planted, the crowns may be above ground or below it, but in either case they need no protection during the winter. When growth begins in spring, a top-dressing of light manure generally enlarges the leaves throughout the

summer, but without it, or in poor soil, they do not become diminutive or badly coloured; on the contrary, I think the colours in the leaves are better defined without the manure, which is apt to induce a gross growth. However well these plants may look in an herbaceous border, it is not the position they should occupy to be seen to the best advantage; or, indeed, to which they are justly entitled. When used in the flower garden, old crowns or young seedlings may be planted; and it is only necessary to lift them once in three years to enrich the soil in which they are growing. Seedlings may be planted in May, but old crowns need removing earlier than that. If the spring is mild they will push by the end of March, and this is the time to shift them if it be necessary. If they are to remain in the same quarters for several years the soil in which they are planted should be deep and somewhat rich. Seed, if sown now, will furnish handsome plants this summer; its seed will germinate although kept for several years, for I have some young plants coming up now from seed which I saved in 1870. The soil I use is a mixture in equal quantities of loam, peat, and silver sand, and so soon as the young plants are large enough they will be potted into 2-inch pots, in stuff very similar to that in which they were raised, but somewhat rougher. Attention to watering until bedding-out time will ensure good plants, and, as they do not grow to any great height the first season, an edging or second front row is the position for which they are most suitable. Here they will develop good crowns and plenty of roots by autumn, and the following season they will be sufficiently grown to fill a space where larger plants are needed. This may be amongst other foliaged plants, or in a bed by themselves; if the latter, each season's seedlings should be made to fill up the edgings, and the larger and older plants kept in the centre. Their habit and aspect is nearer that of some of the dwarf Cannas than anything I can compare them to, and their markings are varied and rich. They do not grow all one height. *F. japonica lutea variegata*, *F. ovata variegata*, *F. lancifolia*, and *F. lancifolia marginata*, are amongst the dwarfiest, while *F. Sieboldii*, *F. grandiflora*, *F. cordata*, and *F. sub-cordata* are much taller, yet none of them exceed 2 feet in height. The leaves of some are striped with bright golden-yellow and deep green. In others the colours are pure white and livid green. The flowers are produced on graceful racemes, which are raised prominently above the foliage, and their colours are pure white, lilac, and puce. The flowers add greatly to the value of these plants in the herbaceous border; but in the flower garden, where foliage is sometimes more needed than flowers, their fine foliage is the secret of their attractiveness. However great is the value of Funkias for the purposes above indicated, I consider them to be of still more importance for decorating the greenhouse, conservatory, or any other indoor place in the winter and spring months. To be in condition for such work at this season, they need to be forced into leaf; but this is easily done. About the end of October, the strongest and oldest crowns to be had should be lifted, and potted into 5 or 6 inch pots. The compost above recommended for the seedlings will do at this time, if a little light manure be added. The drainage should be sufficient to prevent stagnation at any time. The roof should be entirely covered while potting, leaving

only the crown above soil; and, when potted, the plants must be set in a cold frame, and covered up and treated similar to Hyacinths and other bulbous roots. Their root action begins while under cover, so that when placed in a temperature of 65°, about the end of November, the leaves soon expand. By January they are in good order for removing from the forcing-pit into any situation where exquisitely coloured leaves and lovely flowers are required. A couple of dozen pots may be started in succession, and they will last for four months.

M. J.

VIOLA CUCULLATA.

AMONGST the various kinds of Violets, the three principally cultivated in gardens are the *Viola odorata*, *V. tricolor*, and *V. altaica*, and from these, especially from the last-named, have sprung a number of very beautiful varieties. There is, however, a fourth kind, originally introduced into our gardens about the end of the last century, which is well worthy of a place amongst hardy ornamental plants. This, says the "Revue Horticole," is the *Viola cucullata* of Elliot, a Violet which is unusually floriferous, and one which bears some resemblance to the common Violet, but unfortunately has not its delicious scent. It, however, flowers much more freely than the sweet-scented Violet, and its tufted foliage and elegant variegated leaves make it a valuable acquisition. It came originally from North America, and belongs to a section in which there are some fine varieties.



Viola cucullata.

THE AMERICAN COWSLIPS.

THE character of these beautiful hardy border-flowers is best represented by the common *Dodecatheon Meadia*, which is familiar to every one who has even a limited acquaintance with hardy flowers. All of them are striking plants, that should be cultivated in every garden; and though at present some of the sorts are scarce, there is no reason why they should be so, for, with ordinary attention to their cultural wants, they may be grown to perfection and increased abundantly. They will not thrive in all soils equally well, nor in every situation or aspect. They prefer partial

shade; nothing tries their strength more than full exposure to the blazing sun. The finest clumps of the common species which we have ever seen, says "The Gardener," had existed for years in the same spot, in bays formed in the outline of a wide border of American plants facing the east, and backed up by a dense belt of deciduous and evergreen trees of considerable height. In this position the American Cowslips had the benefit of the morning sun, and the cool shade of the shrubs and trees from the heat of the mid-day. It was a moist as well as shady position, and the soil had been prepared in the usual way for American plants. It was deep, and had been liberally mixed with peat, even to the margin, where those plants at least, in so far as they are represented by the shrubby tribes, had not been, and never were intended to be, planted, but where, as represented by the herbaceous natives of America, there were many fine examples, testifying, by their rich luxuriance, that they liked both the position and the preparations

that had been made for them. The border, in fact, had been designed for American plants only, shrubby and herbaceous alike; and little else was admitted into the collection of herbaceous plants brought together in it, except the more choice American species, including the diminutive shrubs of that country, which may properly be associated with herbaceous plants on the margin of such a border. Were I to prepare a spot specially for Dodecatheons, I would select a position similar, as regards shade and aspect, to that they enjoyed so much in the case just described. And if, as regards soil, I had to choose between a light dry shallow soil, and one which was deep and moist, and resting on a cool bottom of clay, I would choose the latter, being sure that the plants would like it best. Should the soil be clayey or very tenacious, it will be brought nearer their liking by freely mixing it with leaf mould, or good peat and old frame-dung in equal parts, and a liberal sprinkling of rough gritty sand. In any good free loam no such admixture will be necessary. Abundance of moisture in the growing season is of the utmost importance to the continued vigour and well-being of the plants, and if at any time during that period they should be liable to suffer from drought, let them be watered without stint, and mulched close up to the base of the leaves with rough leaf mould, old frame-dung, or anything of a similar sort that will serve to arrest excessive evaporation. They are somewhat impatient of frequent removal; and, except for the purposes of increase, they should not be often disturbed when they are thriving well. The best time to divide them is in the spring, when they are beginning to grow, and, except it is desired to make the most of the stock, do not divide very minutely. A single crown will form a plant, but only a weak one, very liable to be cut off by checks which would not in the least affect a stronger cutting. In planting the divisions, use a lighter and sandier soil immediately about them, so as to induce them to root freely the first season; and if they push their leaves before many roots have taken hold of the soil, give them the benefit of a little shade. A flower-pot inverted over the plants will be found as handy a means of protecting them from drying winds and overpowering light as any that can be adopted. They are capital plants for pot culture, particularly *D. integrifolium* and all the varieties of *D. Meadia*, and they may be easily forced into flower in February or March, if well established and strong plants. Grown in this way they are pretty ornaments for greenhouses.

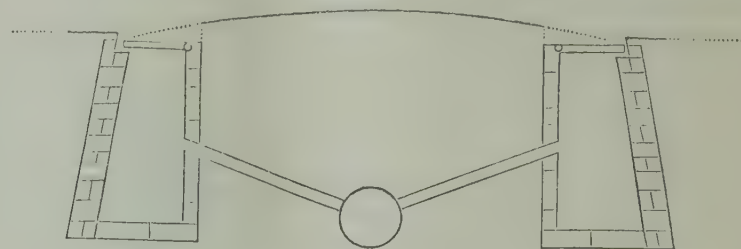
ALPINE AND ROCK PLANTS WITH WHITE OR WHITISH FLOWERS.

I WISH to secure a good number of Alpine and rock plants with white or whitish flowers. Can you assist me?—L. M. [The following list includes all the good kinds in cultivation:—

<i>Achillea</i>	<i>Cardamine</i>	<i>Koniga</i>	<i>Ranunculus</i>
<i>Clavennæ</i>	<i>trifolia</i>	<i>maritima</i>	<i>rutafolius</i>
<i>Andromeda</i>	<i>Cerastium</i>	<i>Leucanthemum</i>	<i>Sagina</i>
<i>tetragona</i>	<i>Biebersteinii</i>	<i>alpinum</i>	<i>glabra</i>
<i>Androsace</i>	<i>grandiflorum</i>	<i>Leucojum</i>	<i>Sanguinaria</i>
<i>Chamaejasme</i>	<i>lanuginosum</i>	<i>vernum</i>	<i>canadensis</i>
<i>cylindrica</i>	<i>tomentosum</i>	<i>Lychnis</i>	<i>Saxifraga</i>
<i>helvetica</i>	<i>Chimaphila</i>	<i>Viscaria alba</i>	<i>affinis</i>
<i>obtusifolia</i>	<i>maculata</i>	<i>Menziesia</i>	<i>Burseriana</i>
<i>pubescens</i>	<i>Chrysanthemum</i>	<i>polifolia alba</i>	<i>ceratophylla</i>
<i>villosa</i>	<i>alpinum</i>	<i>Muscari</i>	<i>Cotyledon</i>
<i>Anemone</i>	<i>Convallaria</i>	<i>botryoides al-</i>	<i>diapensioides</i>
<i>alba</i>	<i>majalis</i>	<i>bum</i>	<i>granulata fl. pl.</i>
<i>alpina</i>	<i>Cornus</i>	<i>Myosotis</i>	<i>hypnoides</i>
<i>nemorosa</i>	<i>canadensis</i>	<i>sylvatica alba</i>	<i>longifolia</i>
<i>sylvestris</i>	<i>Crocus</i>	<i>Nierembergia</i>	<i>oppositifolia</i>
<i>trifolia</i>	<i>biflorus</i>	<i>rivularis</i>	<i>alba</i>
<i>Aquilegia</i>	<i>Cyclamen</i>	<i>Enothera</i>	<i>Rocheliana</i>
<i>cærulea alba</i>	<i>Coum album</i>	<i>marginata</i>	<i>Stansfieldii</i>
<i>Arabis</i>	<i>Diapensia</i>	<i>taraxacifolia</i>	<i>Scilla</i>
<i>albida</i>	<i>lapponica</i>	<i>Ononis</i>	<i>bifolia alba</i>
<i>petraea</i>	<i>Dryas</i>	<i>alba</i>	<i>Sedum</i>
<i>procurrens</i>	<i>octopetala</i>	<i>Oxalis</i>	<i>album</i>
<i>Arenaria</i>	<i>Erinus</i>	<i>floribunda alba</i>	<i>Silene</i>
<i>baccarica</i>	<i>alpinus albus</i>	<i>Papaver</i>	<i>alpestris</i>
<i>montana</i>	<i>Funkia</i>	<i>alpinum albi-</i>	<i>maritima</i>
<i>verna</i>	<i>grandiflora</i>	<i>florum</i>	<i>Silacina</i>
<i>Artemisia</i>	<i>Galanthus</i>	<i>Paradisica</i>	<i>bifolia</i>
<i>argentea</i>	<i>nivalis</i>	<i>Liliastrium</i>	<i>Symphandra</i>
<i>frigida</i>	<i>plicatus</i>	<i>Parnassia, in var.</i>	<i>pendula</i>
<i>Asperula</i>	<i>Helleborus</i>	<i>Phlox</i>	<i>Thlaspi</i>
<i>odorata</i>	<i>minor</i>	<i>subulata alba</i>	<i>latifolium</i>
<i>Aster</i>	<i>Hoteia</i>	<i>Potentilla</i>	<i>Thymus</i>
<i>alpinus albus</i>	<i>japonica</i>	<i>alba</i>	<i>Serpyllum</i>
<i>Astragalus</i>	<i>Hutchinsia</i>	<i>Primula</i>	<i>album</i>
<i>hypoglottis al-</i>	<i>alpina</i>	<i>cortusoides</i>	<i>Trientalis</i>
<i>bubus</i>	<i>petraea</i>	<i>amœna alba</i>	<i>europæus</i>
<i>Calla</i>	<i>Iberis</i>	<i>Munroi</i>	<i>Trillium</i>
<i>palustris</i>	<i>corifolia</i>	<i>nivea</i>	<i>grandiflorum</i>
<i>Campanula</i>	<i>coræifolia</i>	<i>Pyrola</i>	<i>Vinca</i>
<i>cæspitosa alba</i>	<i>Garrethiana</i>	<i>rotundifolia</i>	<i>minor alba</i>
<i>carpatia alba</i>	<i>sempervirens</i>	<i>Ranunculus</i>	<i>Viola</i>
<i>Raineri</i>	<i>Isopyrum</i>	<i>aconitifolius</i>	<i>cornuta alba</i>
<i>rotundifolia</i>	<i>thalictroides</i>	<i>alpestris</i>	<i>odorata alba</i>
<i>alba</i>	<i>Jeffersonia</i>	<i>amplexicaulis</i>	<i>Zephyranthes</i>
	<i>diphylla</i>	<i>parnassifolius</i>	<i>Atamasco</i>

DRAIN GRATINGS.

THE accompanying is a sketch of what I consider the best mode of draining gravel walks or drives. The grating is not cast with the frame, but is set into it and works with a hinge, so that it can be conveniently lifted when the space between the bars becomes choked up, and admits of the sediment (which usually collects at the bottom of the cesspools) being taken out. As will be seen, the main drain is laid along the centre of the walk. The tile for this position is 12 inches wide. Two of smaller size conveys the water from the cesspool into it, and the mouths of these are placed a foot from the bottom of the cesspool, so that all the refuse which passes through the grating collects at the bottom, and is prevented from passing into or in any way obstructing the pipes or tiles. The cesspools are built with bricks, and the top is covered with a stone or thick flag, in which a square hole is hewn for the grating to be placed in. The level of the stone is slightly below the walk and verge level, and I



Walk-drains and Gratings.

like the part surrounding each eye to slope for a short distance into it, when the water, during heavy showers, runs in rapidly and passes away at once.

J. MUIR.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Saxifrages under Glass.—I have *S. oppositifolia* and its white variety now in bloom under glass; they have been out all winter, but having them in pots I have put them into my hardy plant-house that I might the better enjoy their beauty. Both are close creeping plants; but, of the two, the normal form is the more robust. Its flowers are bright red, and rather larger than those of *alba*. In the spring garden both these Saxifrages are very ornamental, whether they are in pots or vases, or upon rock-work. Later in the season, such humble plants would hardly be noticed; but to have them in bloom now, renders them specially interesting.—D.

The Winter Heliotrope (*Tussilaga fragrans*).—This is well worth growing in a warm dry corner in every garden; it soon establishes itself, and furnishes a good supply of its Heliotrope-scented flowers in February and March. This Coltsfoot is now flowering freely in a cool Fernery in Messrs. Veitch's Nursery at Chelsea, and it used to grow well in the gardens of the Royal Horticultural Society at Chiswick, where it had become naturalised on a dry bank in what was called the frame ground.—B.

Naked-flowered Jasmine and Japanese Honeysuckle on Birches.—Some time since, writes Mr. Johnson, of Belfast, in the "Florist," I planted some Birches (*Betula alba*) in the foreground of a garden view, and to each of them I put one *Jasminum nudiflorum* and one *Lonicera brachypoda aureo-reticulata*. These now form a pretty object 10 feet high, the golden flowers in winter and golden leaves in summer having a very pleasing effect.

New Way of Propagating *Echeveria metallica*.—This deservedly popular plant is readily increased by means of cuttings made of the flower-stalks, which, if inserted thickly in pans or boxes during summer, strike root freely; and although they do not make plants themselves, they form a quantity of side shoots, which, if taken off, make good plants in a very short time. I find this plan to be more expeditious than raising plants from seed. Any old plants that are getting too long in the stem may be safely cut down, and the crown will form a dwarf vigorous plant.—J. GROOM.

Gladiolus Brenchleyensis.—This is the best Gladiolus for flower garden decoration. In well prepared beds it flowers from the beginning of July until the end of September, and sometimes later if the autumn is mild. Its proper position is in the centre of a bed or the back row of a border, as the spikes often run up to a height of 3 feet, and look extremely handsome with their showy crimson flowers. The bulbs should be potted singly into 3-inch pots about the beginning of April, and started in a close frame, when they are in good condition for planting out about the middle of May.—J. MUIR.

Tree Lupines as Sea-side Plants.—I find, writes Mr. Johnson, of the Belfast Botanic Garden, in the "Florist," *Lupinus arboreus* to be one of the best of sea-side shrubs. In some ground-work which I had in hand, on rocks that formed a small promontory, I found it to be necessary to undulate the ground in order to secure protection for many plants, but *Lupinus arboreus* made good growth, produced its golden flowers in abundance, and firmly withstood the keenest blasts of winter in the most exposed positions. It likewise produced seeds, and hundreds of plants came up around, without any other care but that of letting them alone.

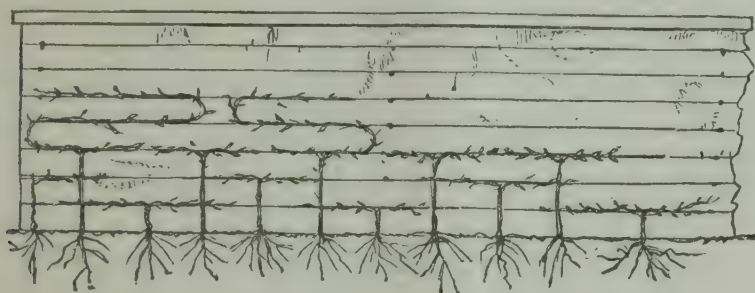
Ewing's Composition for Curing Mildew.—Last summer I gave this mixture a good trial, the great heat and drought having induced mildew to attack Verbenas earlier than usual. One syringing, with the mixture diluted according to directions on the bottle, however, completely cleared them of the pest; and by repeating the application at intervals of a month or so, we were enabled to keep the plants fresh to a very late period of the season. Where Verbenas are not yet given up as incurable, this mixture will be found infallible in keeping in check one of the greatest enemies to which this useful class of plants is liable.—J. GROOM.

THE FRUIT GARDEN.

GRAPE GROWING IN THE OPEN AIR.

(Continued from p. 170.)

THE varieties suitable for out-door culture are few in number, viz.: Black—Black Prince, *Black Esperion, and *Black Cluster; White—*Royal Muscadine and Pitmaston White Cluster. Those marked * are amongst the hardiest and best for the purpose. Black Prince is a fine variety, that seldom fails to colour well, but it is not quite so hardy as the others. I have not named the Black Hamburgh, but I would not dissuade anyone from planting a Vine or two of it as well, in favourable situations. One-year-old plants are best for planting, which may be performed in September or October, just before the plants go to rest, or in March or April, before the buds begin to move. The plants should be shaken out, and the roots combed out carefully with the hand until they are disentangled completely. A hole, about 4 feet wide, 6 inches deep, of semicircular form, and close to the wall, having been made, the Vine should be set pretty closely up to the trellis, in the centre of the hole, the roots spread out evenly in all directions, covered over with the soil, and watered if the soil be dry. When a long wall has to be planted, a continuous shallow trench should be taken out its whole length, and all the Vines planted at once.



Horizontally Trained Vines at the end of the First Year.

The length to which the newly planted canes must be cut back depends upon the system of training adopted, and there is no system so simple, or so well adapted for distributing the vigour of the tree evenly, as the horizontal. I have tried nearly every system recommended, and though the horizontal method is not always adapted for Vinery culture, it is, without doubt, the best for ensuring the regular breaking of the buds and an even crop. This is demonstrated annually here in one long Vinery, where the Vines—now about twenty years of age—are all trained in this manner. I believe it is also the system most generally adopted by the French, and adhered to probably as much for the sake of its perfect simplicity as anything else; it may therefore be safely recommended here. It will be remembered that in my last article I recommended that the wires should be stretched horizontally 18 inches apart. Each of these wires then represents a Vine. Supposing we have a quantity of one-year-old Vines to plant, I should select the weakest, and, presuming the bottom wire to be about 6 inches from the surface of the border, I should cut them



Vine at the end of the Second Year, before Pruning.

down to that length, so that after planting they would just reach the wire to be tied to it. As a great development of leaf and branch is not desirable, and it is important to cover the wall as soon as possible, these Vines need not be planted more than 12 feet apart. When the buds break, all should be rubbed off at an early stage but the two top ones near the wire. As these lengthen one must be trained along the wire to the right, and the other to the left, and when they have each grown about 4 feet they should be stopped. This will cause the buds at the axils of the leaves to get plump and mature, and also cause laterals to start from each joint, which must be pinched industriously beyond every leaf they make; but on no account must they be removed altogether, or the permanent buds, before mentioned, upon which the fruit depends the following year, will break, which would be awkward. This pinching must be kept up till the end of the season. I might have suggested the carrying of the main shoot along the wire till the plants met before stopping, but 4 feet each way, or 8 feet of the young wood altogether, will be ample; for the

sooner the shoots are stopped and pinching is begun, and the more persistently it is followed up, the sooner and better will the wood be ripened—for, next to heat, nothing hurries maturity so much as pinching. So much for the bottom wire, which we leave in the meantime to give our attention to the next one above it, which will be 2 feet from the ground. For this we select our next strongest Vines, cut them back to the height of the wire (2 feet), plant one between each of the bottom wire plants—which, as they were 12 feet apart, will now reduce the space between the plants to 6 feet. Rub all the buds off except the two top ones, and again train these right and left, and stop and pinch exactly as before. Lastly, take the remainder and strongest of the plants which are left, and again plant one between every couple; leave it long enough to reach the third wire, to which tie it, and train it like the others. This will finally leave the stems of the plants 3 feet apart, which is as close as is desirable, and the wall will be partially furnished from the bottom to the height of nearly 5 feet the year after planting, when the bearing shoots should be trained vertically, as will be described. By the above plan, I am, of course, assuming that good one-year-old canes are employed for planting, in which case a year is saved, as it is not necessary to cut the plants lower than the wires which they have to furnish. When the planting Vines are weak it is better to cut them all down to the lowest bud, and plant them 3 feet apart at the first. During the summer they must be trained vertically—one shoot from each—to a height of 4 or 5 feet, stopped and pinched; and in autumn, when the wood is ripe, they must be cut back to the first, second, and third wire in their respective positions, as above described; and the second year the horizontal—right and left—process may be commenced. To fill the top portion of the wall, new limbs must be originated from the highest branches on the first principle, or the first shoots may be simply continued backwards and forwards on the wires till the wall is covered. I should state here that, to prevent bleeding, the Vines should be pruned back to the desired length two months before planting. These directions for training apply to any kind of wall on which there is room for a few Vines; but where the space is narrow, as between windows for instance, or round doorways or porches, it is better to train the Vines vertically, treating them, as regards stopping and pinching, the same as the others. It may appear that I have recommended rather thick planting, but the object is to cover the wall quickly; for it must be borne in mind that the Vines are not likely to ripen their wood thoroughly to the extremities of the shoots in every situation, and it is only that portion of the wood which is brown and ripe that can be left at pruning time. It must not be expected, therefore, that the progress of the Vines will be as great as when they are grown under glass. Thick planting is, for these reasons, advisable at first, as a portion of the Vines may be considered as extras, to be removed as the others encroach upon them. Merely adding, that the roots should be well watered during the summer, when the soil appears to be dry, and that the foliage should be frequently syringed with clear soft water to keep them free from pests, I now come to the second year's treatment. This begins with the pruning of the Vines as soon as the leaves have fallen in autumn. Premising that each Vine has made two horizontal leaders, each a few feet in length—though disappointment must not be felt if the growth is neither lengthy nor vigorous the first year—the pruning consists in simply shortening these back to about 2 feet or 18 inches, or even less if the shoot has not ripened to that distance from the point of origin. The laterals also should be cut clean off close to the permanent bud, which must not be injured, and the operation of pruning the first season is finished. Afterwards, the border may be mulched with short litter or leaves, as a protection to the roots against frost; and if some Spruce branches, or loose bracken, tied here and there with strings, are hung over the Vines, it will be sufficient to save them from any ill effects, even in severe winters. By April the buds will be moving perceptibly, and by the time the leaves begin to unfold themselves danger from spring frosts will be almost past. While the young shoots of the Vine are still unopened, though they may be an inch or two in length, they will stand a lower temperature than many people suppose, and a very slight protection will be sufficient to prevent injury from April or May frosts even when the early leaves are out; but it is better to have some means of protection in readiness, such as a sheet of frigi domo, hexagon netting, or dry Fern or branches, just to hang over the canes at night. The frigi domo, even of the second quality, is the best, cheapest, and most lasting protecting material, and will shield a wall from the severest spring frost we are likely to have in this country when Vines are in leaf. Whatever the material may be, it should only be used against frost, and should never be drawn over the Vines at night till the sun has gone down, nor be left on in the morning after it has risen, in order that the sunshine may play upon the wall for as long a period as possible every day; for the real utility of a wall

depends upon the amount of sun heat it can absorb during the day, and the protection afforded by the radiation of the same during the night. The treatment of the leading horizontal shoot the second year is the same as in the previous year. It must be allowed to extend itself for 3 or 4 feet, tying it to the wire as it grows, and then be stopped, and be kept stopped, the laterals being pinched closely as before directed. The buds which break behind the point shoot—that is, on the portion of young wood that was left at pruning time—must be thinned out at an early stage to 9 inches or 1 foot apart, leaving the strongest as far as practicable. These are the shoots which will bear the bunches, if any, and they must be trained upright, and stopped at the first or second leaf beyond the bunch. This will cause them to throw out laterals both before and behind the bunch, and these must be pinched also at every joint till growth ceases; the object in out-door culture being to get a few well-developed leaves to each shoot rather than a crowd of foliage, which would shut out the sunshine from the wall. Originate the shoot, therefore, at the proper distances apart, stop them at the proper time, and keep them pinched, and earlier fruit and well-ripened wood will be the result. When the Vines come into flower, which will be in June or about that time, they must be guarded, during frosty nights and from severe east winds, with the shading, and care must be taken not to let them suffer for want of water at the root; only see that the water is not too cold. The chill may be taken off with a little warm water; but after July this will not be necessary. If the Vines are pretty strong and healthy, one bunch may be left to each shoot; and when the berries have fairly set, they should be thinned, taking care to cut out the small-looking berries, and to leave the larger ones, and not to overdo it, as the berries of the sorts recommended for outdoor culture are not of the largest size. The bearing shoots will hardly bear tying in before they are stopped; but when they will bend back to the upright position without breaking, they may be tied to a piece of bast or twine stretched from one wire to another for the purpose. After the berries are thinned, the general summer culture consists in attending to pinching and watering, and keeping the border clean, &c. If these matters are attended to, and if the border be mulched with some loose, dark-coloured material, such as Cocoa-nut fibre refuse or leaf-soil, that will prevent evaporation without reflecting, but rather absorbing, the sun's heat, there is little to be feared from red spider or thrips on Vines grown in the open air. In some situations I have heard of mildew being troublesome; and, when it does occur, dusting the leaves with flowers of sulphur by means of a sulphur distributor will generally check it. If all has gone right, the Grapes will be ripe in September or October, according to the locality and the varieties grown; and probably the wasps will be the first to make the discovery. To save the fruit from these pests it is not very troublesome or expensive to enclose each bunch in a thin muslin bag, and the fruit can then hang on the Vines till wanted. The fruit will stand as much cold, or, indeed, more than the leaves, and, while the latter remain on the Vines, the bunches are in no danger, and frosts may be warded off by shading, which will also help to ripen the wood. The pruning of the Vines at the end of the second year differs in no way from that of the previous year, except that the upright or bearing shoots require to be cut back to the base bud; and when the horizontal limbs come eventually to be furnished with these their whole length, the annual pruning consists in simply cutting all off in the same way. In conclusion, though I am not going to recommend heated walls, as that would be next to recommending a Vinery, and my object is to encourage anyone to grow Grapes without further expense or trouble than is involved in the culture and training of the plant, I would remind those who have a warm wall, or a gable behind which is a kitchen fire perhaps, and a flue, that they possess great advantages, and that, in fact, success is certain, other circumstances being favourable. I may also state that, where a wall is devoted to the purpose, it should have a good tile or wooden coping projecting about 9 inches or a foot from the wall. To this it will be easy to fix the shading by means of pulleys, and if a slender rail is fixed every 12 feet or so, with one end in the soil 3 feet from the wall, and the other nailed to the outer edge of the coping, it will serve for a support to the shading when it is drawn up, and it can be tied to a nail at the bottom during the day. When this means of protection is adopted, the greater the body of air between the sheet and the wall, the greater the protection afforded. On a wall covered in this manner, and regularly attended to, I have seen excellent Peaches ripened in the north, where it would otherwise have been impossible.

J. S. W., in "Field."

The Japanese Persimmon.—General Capron, formerly Commissioner of Agriculture, and since for several years residing in Japan, states that "the Persimmon is the best of all the native fruits of that country, and well worthy of introduction into the fruit gardens of temperate climates." The tree is described as finely shaped, having a rich, dark green foliage, and is an ornament anywhere. It comes into bearing from seed in Japan in from six to eight years.

RUSTIC HUTS AND ARBOURS.

In an extensive and picturesque park or garden shelters of various kinds are often indispensable. A "bird-minder's" hovel, where Grass or other seeds have been freshly sown—a covered shed for forester's tools, to prevent the necessity of their being carried long distances—or a general labourer's or woodman's hut in distant plantations, where the mid-day meal may be taken to them by a wife or children, are all more or less necessary in extensive gardens and woods. But, in gardens of every size, bowers and wigwam-like structures, such as shown in our plate, are desirable for many reasons. Such structures but too often appear in the shape of glaring red brick sheds, with naked slate roofs, forming offensive spots on the landscape by their blank ugliness and generally unsuitable character. When a naturally picturesque scene is disfigured by excrescences of that kind it is always very regrettable, as it would be so easy to impart to such features a pleasing aspect. The woodman's hut, in the annexed engraving, is a graceful example of what is meant. Here is a structure within the grateful shade of which three or four men might get a comfortable meal, sheltered from the sun and heat of summer, or the bleak winds of winter; or in which they might take temporary shelter from a drenching shower. Let us compare, in imagination, this picturesque object with a shed of any kind, having a bare prosaic roof, and there need be no hesitation in deciding at once in favour of the rustic hut. Such a structure as that which has furnished the artist with a picturesque subject for his clever picture may, with a little taste, be put together easily and cheaply; indeed, it need not involve a tenth part of the cost of the very ugliest brick shed. It is only necessary to get together a sufficient number of rough, unbarked poles, or tolerably straight branches, of any kind, so that they are of sufficient dimensions, and these will form the chief part of the material required. To put the intended structure together firmly and steadily, a circular shallow trench, from 9 inches to a foot deep, should be dug, of the size required, leaving an undug space where the entrance is to be. A circle of about 10 feet in diameter will be found a convenient size for a hut composed of waste timber of the kind above described. As the first step, in arranging the rustic timber-work, let three of the most suitable poles be selected; and when the thick ends have been placed firmly in the shallow trench, lean their points towards each other, so as to meet in the centre; and then humour their knots, or stumps of branches, till they lodge firmly against each other. Two of the three poles, thus fixed in their places, should be on either side of the entrance, and the third in the middle of the back. Other poles may then be added in a similar manner, till the circle is complete, all but the entrance; and the structure will then have assumed a well-defined tent-like form. The poles should be well wattled together with tough withies near the top, from the inside, in order to prevent the possibility of their slipping out of place. The next process may be an outside clasping, composed of the most gnarled and picturesquely crooked branches than can be got. This clasping should be placed about two-thirds of the height from the ground, forming a wreath of branch-work, passing close above the entrance, and well whipped on to the main poles with tough withies. The pile may then be further strengthened by the addition of another set of lean-to poles wherever the first set have not pretty well shut out the daylight. By this means, crannies will be stopped; the external wreath of branch-work will be still more firmly fixed in its place; and greater stability afforded to the whole structure. The shallow trench should now be filled up, inside and out, and firmly trodden down, when more earth may be heaped against the outside, to any height required, either for effect, or for the purpose of affording more warmth and shelter to the interior. The structure will then be found sufficiently firm for a ladder to be leaned against it, for the purpose of completing the rustic roofing, which may be formed of sods of fibrous turf; and the cavity formed by the meeting of the poles at the top may be filled with stiff gravelly clay, which will form a central reservoir of moisture for the nourishment of the turf, till a natural growth of Moss and Lichen furnish the rugged roof with other and more permanent tones of grey and green. The seeds of straggling, picturesque weeds may also be scattered in the roofing turf,



THE WOODMAN'S HUT.

such as the common climbing Galium, and many other hardy stragglers that do not require much moisture. These will soon form picturesque tufts and streamers, producing a wild and graceful crown of greenery, in harmony with the rugged fashion of the structure. In the raised bank, a plant of Clematis Jackmanni may be placed, and left to itself to find its way among the weedy growths, with which its straggling habit will cause it to harmonise as one of themselves, while flaunting its glorious blossoms in open defiance of their humbler display. A root or two of variegated Ivy may also be planted in the bank, and left to trail down, or climb upwards, as chance, or the nature of the situation may invite. In spring, a few seeds of major Convolvulus may be sprinkled in round the bases of the poles, and, towards May, perhaps, a strong plant of Cobæa scandens might have a chance of making its way up, and suspending its great purple bells among the other living features, with good effect. A couple of labourers, either after the fashion of Mr. Ruskin's amateur road-makers at Oxford, or even of the usual agricultural class, if assisted by a little tasteful instruction, calculated to improve both the teacher and the taught, would be able to put up such a structure within the sunlit hours of a long summer's day. The pleasant task of setting up a picturesque hut, either in the outlying copses of a park, or in the wilder part of a garden wilderness, would be more than repaid, if any reward beyond the mere enjoyment of doing were required, by the pleasure its aspect would not fail to give to others. Let any reader of THE GARDEN take another look at our woodman's hut, and say if it stood near a by path through a pretty wood, and a travelling sketcher got a peep at it, whether he would not at once plant his camp-stool in a good position, take out his sketching block, make his moist colours accessible, and set to work at once; and thus the pleasant day's work of building the hut might, beyond its intended purpose of local use and ornament, furnish the subject of a picture, which, if wrought by a skilful hand, might prove an attractive gem at the next ensuing exhibition of the Royal Academy, and fill the artist's pocket with bank notes. There is a hut, formed with branches after this fashion, in the Glasnevin Botanic Gardens, at Dublin, and in summer, when covered with the large leaves of the Aristolochia Sipho, the effect is very charming. H. N. H.

Paper Protectors.—Mr. Bréhaut remarks that his crop of early Potatoes under glass has been completely saved by the use of newspapers spread over the haulm during the late severe weather, while that of his neighbours, without this protection, has been lost. The extent of defence afforded by paper protectors is almost unknown as yet. The newspapers were suffered to remain on during the succeeding sunshine, so as to avert sudden changes of temperature. Where additional protection is needed, it would be easy to paste together any convenient number of newspapers, and fold the edges over twine (as a boy does for his kite), and these, suspended some inches above the others spread over the haulm, would enclose between the layers enough fixed air to protect anything.—“Florist.”

Pears in Succession.—A correspondent of the “Horticulturist,” says he has been supplied with excellent Pears from the 15th of August to Christmas by the succession offered by the following sorts:—Bloodgood, Seckel, Flemish Beauty, Belle Lucrative, Duchesse, Vicar of Winkfield.

Multiplying the Fig.—M. Rivière recommends a method of propagating the Fig by burying shoots in the ground to a depth of about a foot before winter. The following spring the branches are cut into several pieces, each one of which becomes a cutting, which is completely inserted in the soil. These cuttings make very strong plants during the current year.

Re-grafting Old Pear Trees.—There are many old and worthless Pear trees in almost every neighbourhood that could easily be made a source of pleasure and profit at little expense. Grafting is not very difficult. Cut off the limb, split it, open the split with a small wedge, insert a piece of the limb of the kind wanted, cut like a wedge—say 3 inches in length—putting the inner edges of bark in both graft and limb together, then cover carefully with wax, and nearly all will grow. The wax is easily made. Melt together in a kettle, 1 lb. of tallow and 1 lb. of beeswax, then 4 lbs. of resin; when melted, pour it into a pail of water, and pull it till well mixed.—“Cultivator.”

An Orange and Sugar Cane Garden.—The Magnolia Sugar plantation, 45 miles below New Orleans, is said to be one of the finest plantations of its kind in the world. It is devoted exclusively to the raising of Oranges and cane. The product from the cane of this plantation for 1874 was about 750,000 pounds of sugar and 750 barrels of syrup. The Orange orchard numbers 7,000 trees, and extends for a mile along the river. There, during the month of January, were picked and shipped 1,100,000 Oranges. The trees which thus bear so abundantly, are from four to fifteen years old, the oldest being some 25 feet high, and bearing at one time some 5,000 Oranges.

THE GARDEN IN THE HOUSE.

DINNER-TABLE DECORATIONS.

WITH reference to these I remember, some years ago, when the Royal Horticultural Society first offered prizes for the best plants for that purpose, it was stipulated in the schedule that they must be standards, with, I think, a clear stem 21 inches in height. Now, I do not think that this estimate of the applicability of standards for dinner-table decoration has been generally endorsed. I considered then, and nothing I have seen since has altered my opinion, that a plant with a pendulous or weeping habit may safely be mounted on a naked stem, either by grafting or training; but that plants of a stiff erect-growing habit have a most unnatural appearance when trained as standards, no matter how skilfully done. The plants most generally appreciated for this purpose are low bushes or pyramids, with a pair of weeping standards as central plants; always, of course, making due allowance in their selection for the size of the table. With reference to placing the pots under the table, and bringing the head through, it is not always convenient, even when desirable, to do so; but, for large public dinners or wedding breakfasts, it admits of the introduction of larger plants than would be otherwise possible. In this way I have seen large Palms used as central objects with a good result, as their foliage would be lifted well above the line of sight, with the effect of almost creating the impression that the dinner or breakfast was taking place in a Palm grove in the tropics. In providing the various materials for dinner-table decoration, it should always be borne in mind that the guests that usually assemble in a country mansion remain for several days; hence it is desirable that a change in the style of arranging the decorations should frequently take place. I do not mean a mere alteration of the disposition of the same materials, but a complete change of the whole arrangements. Thus, for instance, the leading feature in one arrangement might be cut flowers and foliage, arranged in suitable glasses; another in which plants in vases might predominate; another in which decorations on the cloth might be largely resorted to, or various combinations in which all three were more or less represented, would give abundance of opportunity for relieving the sameness that too often exists. I am not denying that this will involve some little trouble and forethought, but not much more than has generally been given to it where it has been fairly well done; and, as the propagating season is at hand, an estimate should be formed now of the probable requirements, and provision made accordingly. The truth is, what is really wanted is more variety; for, looking upon the same table, arranged in the same manner, perpetually, or only so slightly modified as to pass unnoticed by casual observers, creates an irrepressible desire for a change of some kind. What is usually understood by decorations on the cloth consists, first, of a free use in various designs, either in the form of bases for the lights or in flat groups, of coloured foliage obtained from the following and other plants:—Coleus, Crotons, Caladiums, Cissus, Begonias, tricolor and bicolor Geraniums, Abutilon Thompsoni, &c.; and, secondly, of dwarf compact masses of growing plants, of which I will speak more fully presently. I should, however, state, first, that a number of pans, made either of tin, glass, or earthenware, will be required. They should have holes through the bottom to permit surplus water to escape, and should be either circular or elliptic in shape, and not more than 1½ inch deep. They might be made in sets of various sizes, and, if made of tin, should be painted to preserve them. They might also be filled in sets; thus one set might be filled with the graceful low-growing Club Moss (*Lycopodium denticulatum*). Small bits dibbled in thickly now, in light sandy soil, and placed in a damp, shady position in a warm house, will soon run over the sides of the pans and completely hide them. *Lycopodium cæsius* may be treated in the same way; only this, being a stove species, will require more heat. When well done, the bluish metallic lustre of its foliage has a rich effect by candlelight. Masses of the white-veined *Fittonia* would form a pleasing variety, as would also the pink-veined leaves of *Gymnostachyum Verschaffelti*. Chopped Sphagnum or Moss should be freely used in the compost for these, and they might be raised just a little in the centre. Several of the low-growing *Alternantheras* might be suitable for using occasionally when more colour was required; but in all cases where erect-growing plants are used, a narrow edging of some creeping plant should be planted next the edge of the pans, as the object should be to have all completely covered. The new Golden Chickweed is another desirable plant for this purpose, as it forms a thick, close growth with a little attention, and has a naturally creeping habit. Although it loses much of its colour in winter, it will be very effective in summer and spring. The golden Thyme and some of the Sedums will also be available; in short, there is no lack of suitable plants. Whenever it is desirable for a change to introduce flowers low on the cloth, nothing has a more beautiful effect than a few pans of Moss

dressed thinly with Roses arranged in various colours, the blooms nestling singly in the Moss, allowing the green setting to show itself surrounding each flower. In the winter season Camellias might be used in the same way, and many other flowers also. Dwarf well-furnished plants of Maiden-hair Ferns in vases, make capital bases for the arrangement of choice cut flowers for the dinner-table, such as Roses and Camellias; and where height and breadth is admissible, I like those better than the Club Moss, as a base for the arrangement of the dessert. I do not think the present custom of placing the dessert on the table has anything to recommend it. The dishes, although intrinsically valuable, are often ugly in shape. I have often thought it would have a better effect, so far as appearance went, if the fruit used in the decoration of the table were arranged on bases of Club Moss, similar to those I have endeavoured to describe, and were allowed to remain till dinner was over, whilst a dessert to hand round might be arranged on a sideboard, or introduced afterwards from a cool room shortly before it was required. It is, I suppose, placed on the table simply for show, or to carry out a whim of fashion; and I think, so far at least as the fruit is concerned, the arrangement I have alluded to would be more effective, whilst the dessert for use could be arranged in the china dishes and handed round; neither would there be much waste or extravagance in so using the fruit, for there is usually at such times a large demand for jellies, &c., and all spare fruit from the dessert could be used for that purpose, instead of fresh.

E. HOBDAV.

Darwin's Abutilon.—Though new at South Kensington, this plant is not altogether so here in Dublin. We, and doubtless many of our readers, had the pleasure of making its acquaintance growing and flowering freely out of doors in the open border at Glasnevin during the autumn of the past year. We were at first sight much taken with it, and very favourably impressed as regards its value, not alone as a plant for indoor decoration, but further in respect of its adaptability for outdoor use, and playing an effective part in the flower ground during the summer and autumn months. It is very distinct in appearance and habit from the other species of the genus with which growers are familiar. Instead of being somewhat lanky and straggling as they are, it is of a very compact, dwarf habit, and the foliage instead of being thin, flimsy, and smooth, is stout, substantial, large, and somewhat pubescent. In shape the leaves are pointedly three-lobed. The wood is short jointed, and from every axil the flowers are produced freely. In the matter of size, colour, and appearance, the flowers are very much like those of the old *A. striatum*, except that in those of the plant under notice the colour is of a darker orange. In the production of flowers it is so precocious that before it grows a span high it is a flowering plant. When we first saw it out of doors at Glasnevin the plant then was not more than nine inches high, and yet it was blooming profusely. Dr. Moore, unwilling to risk his plant by putting it to the winter test, had it lifted early in November, in full flower, and housed, and, notwithstanding the disturbance, when we again saw it some time after, it was flowering, and has, we believe, continued to flower ever since.—"Irish Farmers' Gazette."

Ricinus Gibsonii.—This, introduced by Messrs. Veitch, is described as being distinguished from all other varieties by the intense deep red colour of the foliage, which reminds one of the dark-leaved varieties of *Amarantus*, now so much cultivated. It grows from 4 to 5 feet high, and has a fine branching habit. It will undoubtedly take a high position in the sub-tropical garden on account of its bright hue, which is retained during the entire season. It is a native of the Philippine Islands, and is named in compliment to the late Mr. Gibson.

NOTES AND QUESTIONS ON THE GARDEN IN THE HOUSE.

Adiantum Farleyense for Hair Decoration.—It may not be generally known that fronds or parts of fronds of this Fern, when fully matured, answer admirably for ladies' evening head-dresses, and that immediately submerged in cold water when done with for the evening, they will be as fresh and good the second night as when just cut.—RICHARD NISBET, *Aswarby Park*.

Geranium echinatum.—This *Geranium* differs from many others in its wood being thickly set with spines like that of a Rose. Its tiny white and magenta-spotted flowers are very pretty and becoming for button-holes. It is much grown at Chilwell for this purpose and for making bouquets, into which it can be very easily wrought, as the flower-stalks are from 10 to 12 inches long.—M.

Water Convolvulus.—In answer to "International," allow me to say that there is no meaning in this term, which can only be a local misnomer. None of the *Convolvulus*es or Bind-weeds, are aquatic; quite the reverse. If the great Bind-weed once gets into a shrubbery, it is impossible to eradicate it; and common people in the north, for this reason, call its troublesome roots Devil's-Gut. The term mentioned is not given as a synonym, or local name, in any book that we know of. If the plant is a pure aquatic, it is very likely to be the common Frog-bit, a favourite plant for an aquarium. It has large white flowers, yellow in the centre, above the surface of the water. Why not show it to some botanist?—J. P.

TREES AND SHRUBS.

NOTES ON BEECHES.

THE genus *Fagus*, or Beech tribe, comprises several species, of which only one, the common Beech (*Fagus sylvatica*), is indigenous to Europe. The New World possesses the largest number of species, viz., *F. americana* and *F. ferruginea*, in the United States; *F. obliqua* and *F. procera*, in Chili; and *F. antarctica*, in Patagonia and Tierra del Fuego. An indigenous species of Beech (*F. Cunninghami*) is found in the temperate regions of Australia, where it is known to the colonists as Native Myrtle. It is a large, handsome, evergreen tree, and attains a height of 195 feet; its timber is hard, beautifully veined, and much esteemed by furniture makers. In the temperate mountainous part of Java there are two species of Beech, viz., *F. javanica* and *F. argentea*. With the exception of *F. antarctica*, which is a stunted evergreen tree, with dense brown foliage, all these species of Beech are large, handsome, hard-wooded trees, yielding valuable timber. The nuts of the two Javanese species form a favourite article of diet with the natives of that country. In America the nuts of *F. ferruginea* are very generally used as a dessert. *F. obliqua* and *F. procera* have been introduced into various parts of Europe, where they have become acclimatised. Both of these trees are justly admired for their stately crowns and beautiful green foliage, which render them desirable ornaments in parks and large pleasure grounds. The common Beech (*F. sylvatica*) is found in most parts of Europe, and it is also very generally distributed over the northern and eastern States of the American Union. It is one of the handsomest and most valuable of our forest trees. Its trunk is erect and massive, and its height usually from 100 to 130 feet. The roots spread for 10 or 12 feet round the tree, but none of them go deeply under the surface, except the tap-root, which penetrates perpendicularly into the earth for 3 or 4 feet. The branches have a more or less upward tendency, and form a symmetrical and majestic crown. Upon young trees the bark is of a greenish-grey hue, but as the tree matures it assumes an ash-grey colour. Both leaf and blossom buds are long, cone-shaped, sharp-pointed, and consist of eighteen or twenty brown, slightly fringed scales. The leaves, when young, are soft and delicate, and of a beautiful yellowish-green colour, but, as the season advances, they become deep green. In October they become yellow and dry, shrivel up, and fall to the ground. Upon young trees, however, the withered leaves often remain until they are forced off by the swelling of the fresh buds in spring. The male catkins, which are in general four to a bud, have long drooping peduncles, and consist of about twenty greenish-yellow florets. The calyx of each floret is regular, bell-shaped, monosepalous, and divided at the top into five segments. There is no corolla, and the calyx usually contains twelve yellow anthers. The female blossoms, which appear in pairs upon the young shoots, consist of sharp-pointed catkins, broad at the base, and provided with numerous hairy monosepalous calyxes. The fruit, which is ripe in October, consists of rough spring capsules, each of which contains two or three smooth triangular brown nuts. The northern limit of the common Beech in Europe is 60°, and in America 51°. The highest elevation at which it is found is 5,000 feet above the level of the sea, but it does not seem to thrive well at a greater altitude than 2,000 feet. In Thuringia and among the Harz Mountains noble Beeches, 100 feet in height, are found at an elevation of 1,800 feet. The finest Beech forests in the world are situated in the island of Rügen, on the dunes of Denmark and Mecklenburg, and on the plains and low hills of Germany. It is in these regions, where Beech forests cover many thousand acres, that the tallest living Beeches are to be found. In the last century, Beeches 174 feet in height were cut down in North Germany, and at present many single trees exist there which are 136 feet high and 41 feet in circumference. Beeches thrive best in a surface-soil of poor, dry, sandy loam, with a sub-soil of chalk mingled with gravel, sand, and small stones. Those trees which grow upon mountain slopes, or on low humus-covered hills, with a northern or eastern exposure, yield the best timber. Beeches are generally propagated by means of seed, and young trees suffer much from frosts and

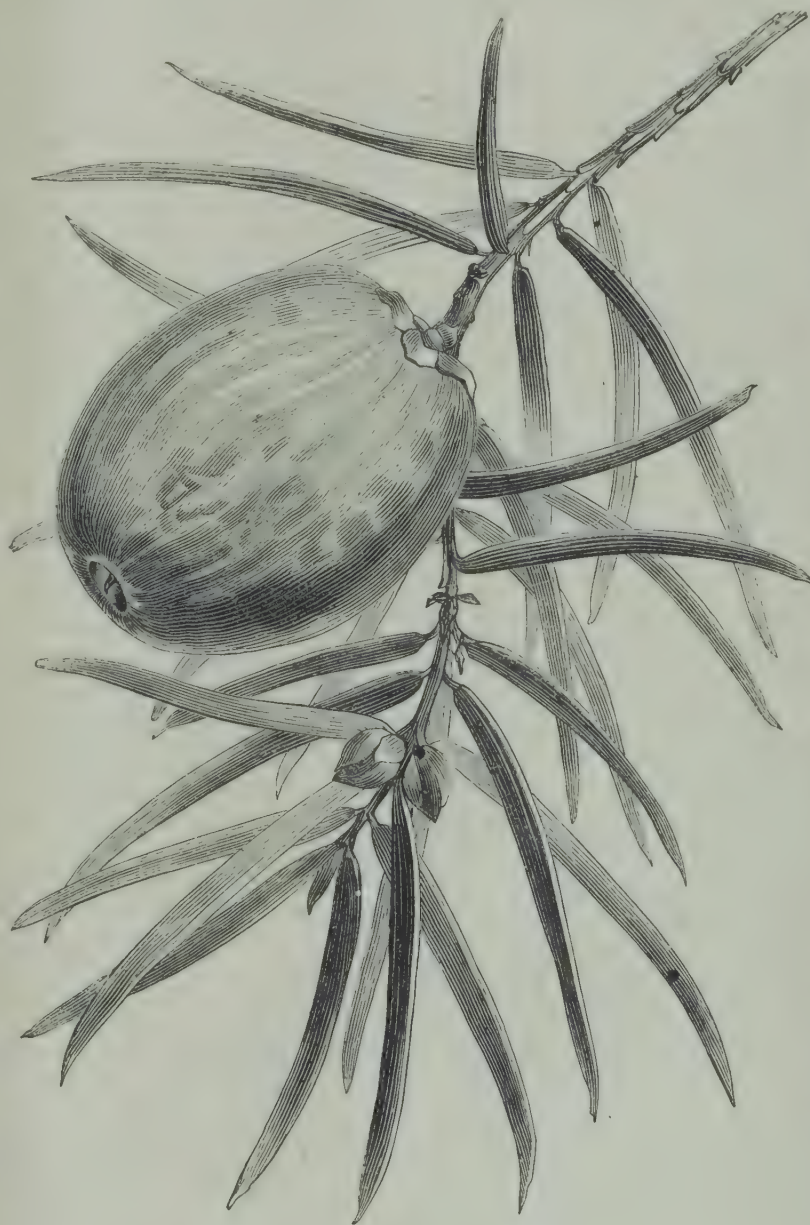
droughts, and in damp marshy situations. Mice and mole-cricket are also very destructive to the roots of young trees. The Beech attains its full height when about 100 years old, and then lives in perfect vigour and health for 200 or 300 years. Trees of this age are generally from 10 to 15 feet in circumference, and contain from 10 to 12 cords of timber. A cubic foot of fresh-cut wood weighs 65 lbs.; but this, by thorough seasoning, is reduced to 41 lbs. or 39 lbs. In damp poor soils, Beech trees frequently perish from internal rot between their seventieth and ninetieth years. Of the common Beech some very ornamental varieties may be met with in cultivation—as, for example, different kinds of weeping Beech, the variegated purple and copper-leaved kinds, and the Fern-leaved Beech, the leaves of which are cut into narrow segments, resembling the fronds of a Fern. These are almost wholly used for purposes of ornament, for which the common Beech itself is well adapted. The products of the Beech are numerous and valuable. The timber, which is heavy, hard, firm, and durable, is employed in the manufacture of numerous implements, tools, and articles of furniture. On account of its brittleness and liability to the ravages of insects, it is seldom employed for building purposes. The timber of the common Beech is inferior to that of *F. americana* and the two Chilean species already mentioned. Beech timber is especially adapted for sub-aqueous structures, or for positions in which it is not exposed to the action of the atmosphere. As fuel, the Beech is very valuable, and is surpassed in heat-giving qualities only by the Hornbeam and Maple. The charcoal of the Beech is highly esteemed on account of the equable heat which it emits. The bark is useful to tanners, and from the ashes of the wood excellent potash is obtained. In Denmark, Sweden, and some parts of America, the leaves of the Beech are carefully picked, dried, and used to stuff bed-ticks and pillows. The leaves and ashes form an excellent manure for grass and clover lands. The husks and nutskins contain a very poisonous material known as *fagin*. The nuts themselves form a favourite food of some birds and quadrupeds, red deer being especially fond of them, and they are also, in some countries, boiled, dried in the open air, parched by artificial heat, and ground into meal, from which bread and soups are prepared. The nuts have a pleasant sweetish flavour, and are very oleaginous. Considerable quantities of oil, resembling Almond oil, are obtained from them by pressing. From 100 lbs. of nuts, 12 lbs. of pure oil, and 4 lbs. of coarser oil are obtained. The former is of as good quality as the best Olive oil, and the latter makes a useful lamp oil. The refuse furnishes a good food for pigs. The best season for felling Beeches is the month of December. Beeches are very liable to be attacked by insects, the most destructive of which are *Phyllobius argentatus*, *P. micans*, *P. maculicornis*, *Rhynchænus coryli*, *Orchestes fagi*, *Melolontha fullo*, *M. solstitialis*, *M. hippocastani*, and *M. vulgaris*, all of which subsist on the leaves of the tree; the three last named frequently denude the tree entirely of its foliage. *Anobium tessellatum*, *Buprestis fagi*, and *Ptilinus pectinicornis*, may be named as very injurious to the wood. The most destructive,

however, are *Buprestis tenuis*, *B. nociva*, and *B. viridis*, all of which penetrate and cut the wood. The following butterflies also live upon the Beech in their grub state: *Bombyx æsculi* and *Cossus ligniperda*, in the wood; *Bombyx monacha*, *B. purdibunda*, *B. neustria*, *Geometra defoliaria*, *G. pusaria*, and *Tortrix splendana* upon the leaves. Numerous other beetles besides these already named also inhabit the tree, but all of them are harmless. The squirrel and dormouse frequently make their home in the Beech, and among its branches may be seen the nests of the wood-pecker, raven, jay, finch, and titmouse.

JOHN HUTCHINSON, M.A.

FRUIT OF TORREYA MYRISTICA.

THE drupaceous fruit of this plant, figured by M. Carrière in the "Revue Horticole," is so singular that we reproduce it. It usually



Fruit of *Torreya myristica*.

ripens about the middle of September, and then drops, leaving a capsule which dries up. When the fruit has attained full development, the branch that bears it appears to be much exhausted. The leaves become yellow and then fall, and subsequently the branchlets themselves die. A plant of this kind of Yew was planted about eight years ago in the open air in the establishment of MM. Thibaut & Keteleer, at Plessis, Piquet. It is now about 19 feet high, and its stem, which is furnished with branches from top to bottom, measures about 18 inches in circumference, and these branches are covered with leaves in such a way as to form a compact green mass, which has a very beautiful appearance.

AMERICAN AND BRITISH LARCHES.

IN the northern parts of the United States, Hackmatack is the name given to the Larch. The French Canadians call it *Epinette Rouge*, and the numerous descendants of the Dutch in New Jersey know it as *Tamarac*. The locality of both the European and the American Larch is more strictly confined than that of any other resinous tree of the northern zone of the two Continents. Michaux describes the American species as being most abundant in Vermont, New Hampshire, and the district of Maine; but though the soil is well adapted to its growth, and the winter is long and severe, it does not form the hundredth part of the resinous growth, which consists principally of the Black Spruce, the Hemlock Spruce, and the Red Cedar. It is only beyond the St.

Lawrence, particularly near Lake St. John, and the Great and Little Lake Mistassin, that it begins to abound, and to form masses of forest, some of which are several miles in extent, and it is abundant in Newfoundland, in nearly the same latitude. New Jersey, Pennsylvania, and the coldest and gloomiest exposures in the mountainous tracts of Virginia, are the limits of its appearance toward the south, but it is rare in these States; and in Lower Jersey, in the vicinity of New York, it is seen only in the swamps of White Cedar, with which it is scantily mingled. In Vermont and the district of Maine, the Larch grows only in low and moist places, and never on uplands, as about Hudson's Bay and Newfoundland; hence we may conclude that the climate of the northern extremity of the United States is too mild for its constitution.

The American Larch has a slight, straight trunk, about 80 or 100 feet high, and 2 or 3 feet in diameter. The wood is superior to that of any species of Pine or Spruce, and unites all the properties which distinguish the European species, being exceedingly strong and singularly durable. In Canada it is considered as

being among the most valuable of timber, and has no fault except its weight. In the district of Maine it is more esteemed than any other timber for the knees of vessels, and is always used for this purpose when proper pieces can be procured. Turpentine is never extracted from it in America, as is done from the American species in Europe, but not in Great Britain, as it ruins the timber. Venice turpentine is the article obtained from it.

The European Larch.—In Great Britain the Larch, formerly unknown, has been very extensively planted within the last century, the first plantations being made on the estates of the Duke of Athol, at Dunkeld. The lower ranges of the Grampian Hills, which extend to Dunkeld, are at an altitude there of from 1,000 to 1,700 feet above the level of the sea. The Larch trees are planted as high as 1,200 feet up these hills, and grow exceedingly well, a situation where the hardy Scotch Firs cannot rear their heads. The growth is very rapid, and Fir of the same age gives only half the quantity of wood. In the Larch plantations of this country we have several varieties of the tree, some having white flowers, or female catkins, and some having red; and we generally find trees with their flowers and timber of all shades between white and red. These differences in the colour of the flower and wood being no doubt caused by some accidental circumstances of soil or impregnation. Dr. James Brown observes of this tree—"As to the durability of the timber of the Larch, it is allowed, by all who have had occasion to use the timber, to be decidedly the toughest and most lasting of all the Coniferous tribe we are yet acquainted with." There is also a peculiar feature characterising the wood, viz., its being durable and tough when only of a few years' growth. A Larch paling, put up with wood from fifteen to thirty years old, lasts from fifteen to twenty years; if of Scotch Pine, of the same age, from four to six years; and if of Spruce Fir, from seven to nine years. If Larch posts are used, they will last from eight to ten years in a fair state; if of Spruce Fir, from four to five years; and if of Scotch Pine, from three to four years. Its durability makes it much sought after for mining purposes, and for this purpose large quantities of it are annually used. For the purpose of sleepers there is an unlimited demand, this sort of wood being always preferred for that purpose where it can be had, as it is found to last longer than any other kind when laid on the earth. It is difficult to season, as it is almost impossible to keep it from bending and twisting, and Mackintosh mentions steaming as one resort for overcoming this tendency. Some steep it, while in the log, in water for twelve months, then take it out and dry it twelve months more before cutting up. Others prefer the practice of barking the tree while standing, and then leaving it a year before it is cut down. The Athole, frigate, built of it in 1818, the Larch, a fine brig, built by the Duke of Athole several years earlier, and many others built since these dates, have, according to the "Builder's Reporter," proved the Larch to be as valuable a timber for naval purposes as its most sanguine advocates could desire. The wood, containing an insoluble varnish, preserves iron nails driven into it from rust, and after a lapse of twenty-three years they have been found to be as perfect as when they first came from the forge. One of the qualities of the Larch for building merchant ships is its great lightness, a cubic foot weighing, when seasoned, only 34 lb.; although it is not so strong as many sorts of wood, it has great resilience. Cabinet-work of great beauty has been made from it; it polishes well, and when well seasoned is not found to warp or shrink. A most important fact, as regards rural economy, has arisen from planting Larch trees on rocky ground. The vegetable compost found thereon by the falling of the leaves has been the cause of producing herbage for feeding, and making the land worth 12s. to 14s. per annum, which was not formerly worth more than 8d. or 9d. The tree is not particular as to soil, but the roots must be in a soil deep and porous, which has been cleansed by the free passage of water through it, and which has, at the same time, the benefit of being constantly kept clean and in a wholesome state by good descent for the water that may fall upon it. It does not thrive on thin lands, nor on those having a retentive sub-soil. Much of the disease in our Larch plantations, (says Dr. Brown) has been occasioned by imperfect drainage. The common Larch is a native of a great part of Central Europe, and forms forests in the upper regions of the Alps of France and Switzerland, from east to west, at elevations of from 3,000 to 6,000 feet above the sea-level; and when found above the latter height it is but a dwarf scrubby bush. It is less common on the northern than on the southern slopes of the Alps. It is found on the Carpathian Mountains, and in the Tyrol and Hungary.

Mr. Meehan on New Conifers and their Synonyms.—There is a disposition among botanists to make numerous species of our American Coniferæ. Mr. Hoopes did good service in his "Book" by throwing many of these novelties back to their proper places.

There will be plenty more work for him in a new edition. *Pinus Jeffreyi* may go back to *P. ponderosa*, and so on of many others. Then we have *Picea bifolia* and *P. magnifica* of Murray, and *P. violacea* of Roetz, which will probably have to go back to *P. grandis* as *P. amabilis*, *P. lasiocarpa*, and *P. Parsoniana* have had to do, and we should be inclined to put *P. concolor* among these probabilities, only that we have more faith in Dr. Engelmann's powers of discrimination than in some others, though, of course, the best of botanists may be mistaken. That all these may be distinct forms well worthy of separate propagation, as we separate Tom Thumb, George Peabody or other Arbor-vitæ in cultivation, is well enough, but no one wants to burthen botany with specific names for these. Another matter we may refer to here, is that the English papers speak of *Picea concolor*, Engelmann, but there is no such plant. It is *Abies concolor*, Engelmann. It should be explained that originally the genus we now call *Abies*, was *Picea*; and the *Picea*, *Abies*. Most horticulturists, chiefly, we think, through the great influence of Loudon, follow the change. Botany, however, is strict on the laws of priority, and if right in one case, it should be in all. Dr. Engelmann is always strenuous in behalf of right, and hence calls the Firs *Abies*, and not *Picea*, and the Spruces *Picea*, and not *Abies*. We know that Mr. Hoopes, equally with ourselves, knowing that Dr. Engelmann is right, and that right should prevail, has been always disposed to "call things by their right names." But the error is so widely diffused, and maintained by the whole force of English horticultural literature, that we have shrunk from the confusion that would follow an attempt to enforce the rule.—"Gardeners' Monthly."

New Variegated Plane.—Some time since, Professor Karl Koch called attention, says the "Florist," to a new variegated Plane (*Platanus orientalis Rosenthalii*) which he had seen in Mr. Rosenthal's nursery in Vienna. "True," he says, "we have had a variegated Plane in cultivation for some year, but it is far inferior in point of beauty to the one in question, being of a permanently shrubby habit, and possibly belonging to *Platanus cuneata*, Willd., a species I found on my second trip to the Caucasus in 1844, growing on the banks of rivers and rivulets on the south-eastern slopes. The unequally five-lobed leaves, too, remain small, barely attaining 4 inches in length; and the variegation consists of yellowish-white patches or stains, most abundant near the circumference. Of Rosenthal's variegated Plane, which is a variety of the Oriental, only small, shrubby specimens were seen, but should it prove to retain its variegation in the adult stage, we have here one of the most beautiful ornamental trees imaginable. It has ample leaves, usually somewhat broader than long, its broadest diameter reaching about 10 inches, whilst from the top of the petiole to the opposite extremity of the blade it is only about 7 inches; it has an abrupt base, each half of the blade forming a right angle with the petiole. The agreeably conspicuous yellowish-white markings cover by far the greater portion of the surface; but the white is interspersed with green streaks."

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The Large-flowered Jasmine (*Jasminum grandiflorum*).—This Jasmine is well worth adding to the most select list of greenhouse climbers. It is a native of the East Indies, and naturalised, according to Vol. II. of the "Botanical Register" (where it is figured at p. 91), in the Island of Tobago, where it forms an undergrowth in the woods. It is largely cultivated in Catalonia, especially near Barcelona, and "oil" of Jasmine is there largely made from its flowers, while the peculiar long pipe-stems, so highly prized by the rich Moors, are made from its slender stems. It has been grown in this country since 1629, and used formerly to be imported along with Orange trees by the Italian nurserymen. It does best grafted on the common Jasmine and on *Jasminum officinalis* as a stock.—B.

Deutzias from Seed.—How many varieties of *Deutzia* are there in cultivation? I find the following in books, viz.:—*D. canescens*, *D. corymbosa*, *D. staminea*, and the old *D. scabra*; there are also *D. crenata* fl. pl. and *D. gracilis*. Where are the three former to be seen? To show how easily they may be increased, I may state that I raised a batch of seedlings a few years back, and among them is a pretty single pink kind and a very good double white. There are others, too, somewhat similar to *D. crenata* fl. pl., which was the parent of all of them. I could never get seeds from *D. gracilis*; but a double variety or a pink variety of the habit of *D. gracilis* would be an acquisition.—H. M., *Engs.*

New Timber Country.—A new timber-producing district is said to have been discovered in the interior of Newfoundland, a region hitherto supposed to be utterly barren. Amongst its naked mountain ridges and dreary swamps, Mr. A. Murray, an officer of the Geological Survey Office at St. John's, has come recently, according to a correspondent of a contemporary interested in colonial affairs, upon a rich country, which is expected to develop immediately a prosperous lumber trade, and, ultimately, to attract agricultural settlers.

Chestnut Trees.—Some years since—probably a good many—we are informed, there stood at Fortworth, in Gloucestershire, a Chestnut tree said to be 1,100 years old. The same tree was standing in 1150, when it was called "the great Chestnut of Fortworth." It measured 52 feet round.

Plants in Schools.—Dr. W. Kuby has published a treatise on the hygiene of schools. He recommends the introduction of leafy plants and shrubs at suitable intervals into every schoolroom, and attests the utility of the arrangement from experience.—"Lancet."

GARDENING FOR THE WEEK.

Roses Out and Indoors.

THE winter having been severe for out-door Roses, it is advisable to uncover now where this has not already been done, and to examine all beds and plantations so as to fill up vacant places before the season gets too far advanced. In some parts, where operations have been retarded by snow and heavy rains, a great deal of planting has yet to be done. If a vacancy occurs after this time, it must be filled by means of plants turned out of pots. I have found March to be the best month to go through all Roses, and to prune, tie, train, and stake them; but where great neatness is insisted on, Roses should be shortened back in December, when fallen leaves, &c., are being cleared up. Doing this does not hurt the plants, and it gives them a more uniform appearance than they otherwise would have. Where there is a large collection, and a continuous supply of Roses is wanted, good blooms may be obtained about the end of May or beginning of June, and, by carefully removing all dead flower-stalks every week, a continuous supply may be kept up all through the season. In pruning, care must be taken to thin out the bush, and to leave room for young shoots, so as not to have them overcrowded. Where Roses are wanted to form weeping or umbrella trees, cut all the shoots to equal lengths, and, where wire is not used, train all down with string to a centre stake; by so doing handsome specimens may be obtained. There are many varieties that are much weaker growers than others, and these require close pruning. Almost all Hybrid Perpetuals, Teas, and Bourbons succeed well pruned back to three or four buds; but Noisettes and Chinas do not require quite such close pruning. In the case of pot Roses, for forcing early for Christmas and New Year's Day, certain plants must certainly be sacrificed in order that perfect specimens may be obtained at that season. Charles Lefebvre will flower at that time, and I have cut *Devoniensis* and *Maréchal Niel* as fine at Christmas as in March. Good forcing varieties of Roses are now almost countless, but I always maintain that the selection of kinds for that purpose is best left to growers themselves, that is where a quantity is required. There are, however, many kinds which it is useless to grow, if blooms have to be packed or sent away. At one time we had only a few varieties that would force well, such as *Sidonia*, *Madame Laffay*, *Duchess of Sutherland*, and *Geant des Batailles*; but now we have a splendid assortment of new Roses that will force, and I hope to see the time when Rose blooms will be as plentiful as those of *Camellias* in the dead of winter. Roses, to bloom in March, will come in, even under greenhouse treatment. I do not think that plants for forcing should be fresh lifted every season; on the contrary, I have plants that have been in the same pots for ten years, and which never have had fresh soil applied to them.—H. G.

Hardy Flowers, Alpine Plants, and the Wild Garden.

During the first or second week in March there should be an overhaul of seeds to be sown. Some, of course, have been saved during the previous summer, others purchased, and possibly not a few may have been picked up in an autumnal tour of inspection. Be the source, however, what it may, it is now high time that they were looked over, and in due course sown, as my experience with seeds, more especially of our hardier plants, is that an early sowing very often saves a season. No one who has had much experience in seed sowing can have failed to notice how tardy and irregular the growth of autumnal-sown seeds is compared with those sown in spring; nor, indeed, is this surprising, as the gradually-increasing power of the sun's rays, charged with active influence, is not only conducive to the development of seed life, but is felt, and that, too, in a very pronounced way, by Man himself—the most highly-developed form of animal organisation—and may be traced through the whole series of gradation in organic life. Truly do we recognise the spring as essentially the seed time—antipodal to harvest; does not the embryo, as it springs from its hibernatory store-house—the seed—give us, to some extent, the origin of the word spring, one of the most gladsome words in our whole vocabulary? A few remarks, therefore, as to the mode and process of sowing the seeds of such plants as come under our especial heading may not be out of place. Herbaceous and Alpine plants in this operation must be treated quite distinctly from the ordinary annuals and biennials, about which I shall have a word or two to say by-and-bye. For the present I confine myself to the former. Though in very exceptional instances, as regards the plants themselves, and in equally exceptional conditions of soil and situation, it may be advisable to sow them in the open ground. As a general rule they are better sown in pots or pans and placed in a cold frame, where they will receive protection from heavy showers that not unfrequently denude the seeds of their covering-protection; under these conditions, too, they are readily amenable to the

process of shading from the drying influence of the sun, and are safely removed from the possibility of spring frosts and east winds. Independently, moreover, of the foregoing reasons for adopting the media of pots and a cold frame as best adapted for this purpose, there are others, the most important being that this arrangement enables you to remove those pots, wherein the seeds are endowed with natural powers of early vegetation, to another frame, where they may enjoy a greater degree of sunshine and consequent vigour, combined with sturdiness of growth—without exposing those which have not grown to similar conditions, which, in their case, would be prejudicial. Then, again, amongst plants of this class, the size of the seeds varies so considerably that, whereas one may vegetate freely under the depth of half-an-inch of soil, another must be sown almost on the surface. Thus individualising the species enables the operator to deal with each, according to its special requirements. In preparing the seed-pots, as in every horticultural and agricultural operation, a thorough and efficient drainage, by means of crocks to rough ashes, is a necessity. It acts in two ways; first, by preventing the soil in which the seeds are sown from becoming water-logged; secondly, by admitting from below, as well as from above, a free supply of atmospheric air, which has a most important chemical function to perform in stimulating the dormant energies of the seed into active life. The next point is to secure a good loamy soil of somewhat sandy texture, and, if possible, a little well-rotted leaf-soil combined therewith in a proportion of about one to three—the whole passed through a medium-meshed riddle—the rough material to be placed over the crocks, so as to prevent the drainage getting choked up; the fine portion to be filled in above and well pressed down. Do not be afraid of making it firm, as seed rootlets, however tender they appear to be, have wonderful powers of penetration, and prefer a hard soil, which retains a more equable degree of moisture than a light one, which is liable to great fluctuations in this important respect. The pots being filled to within half an inch of their surface may then be sown, but, before doing so, a little soil passed through a fine riddle, and well mixed with good sharp sand (silver sand is preferable, as it takes the water readily), should be prepared, and used for the purpose of covering the seeds. As to the thickness of this covering, a very safe rule to follow is, that it should equal the diameter of the seeds—that is, when the seeds are sown under the conditions herein described. Prior to the seed pots being placed in the cold frame, it will be well to give it a good dressing of fresh slaked lime and soot mixed, so as to destroy slugs and worms, both of which are highly prejudicial to the success of the operation. Above this dressing nothing is better than a layer of 2 or 3 inches of ashes, and care should be specially taken to place the pots level, so that the seeds may vegetate freely over the entire surface at one and the same time. If the soil be reasonably damp no water need be given for a week or ten days, but the frame must be shut up and shaded, after which a gentle sprinkle with tepid water, with a fine rose, will be found beneficial; and, as a rule, as the season advances, it is better to throw the lights off the first thing in the morning, and give them water about eight o'clock, by which exposure the pots that are really dry will have indicated themselves, and thus the watering operation, too apt to become general, will be confined to those pots alone that require it.—JAS. C. NIVEN.

Flower Garden and Pleasure Grounds.

Where the planting of deciduous trees and shrubs, and the laying of Box and other edgings, have been delayed in consequence of the severity of the weather, these operations should now be brought to a close as soon as possible. On light soils, under the shade and drip of trees, and in other unfavourable situations where "living edgings" seldom succeed well, an edging-tile of some sort should be used. These can always be had of various patterns, and may consist of common brick, terra cotta, terra metallic ware, glazed stone ware, and of glass. Some, composed of the latter material, are of a green colour, and remarkably neat in appearance, and well adapted as edgings for flower beds and borders. Hollies, Laurels, and all other evergreen shrubs and trees may now be pruned wherever they are found to need that attention. It is seldom advisable to compel shrubs and trees to assume forms different from those which are natural to them; but they may, nevertheless, be frequently assisted in this matter by the stopping of unduly developed lateral branches or rival leaders. While strong growing species should be prevented from unduly encroaching upon less robust, but choicer sorts. Young Coniferous trees of all kinds may frequently be greatly benefited by the judicious stopping of lateral branches, so as to direct the energies of the plants towards the development of the stems or leading shoots. Hollyhocks may now be planted out, as may also Pinks, Carnations, Picotees, and Pansies, and all beds or clumps of these and similar plants, which may have been planted out last autumn, should now be carefully examined, as many of them

may be found to be somewhat loosened in the soil, by the action of the recent frosts, and should now be made secure; the surface of the beds too should be refreshed by a portion of new soil, and all deficiencies, where they exist, should be made good. Annual flowers of all sorts, if required to flower early, may now be sown in gentle warmth, in pots or seed-pans, to be pricked out, when large enough to handle, into boxes or frames, so as to be ready to be planted out early in May, in beds or borders, in which they are intended to flower; or, should the weather be favourable, they may be sown at once in the open ground; during most seasons, however, the first week of April is sufficiently early to do this. In cases where it may be intended to edge or margin the flower beds with any of the dwarf hardy Alpine, or other plants suitable for that purpose, this may be done now, should the beds be empty, or should it be found possible to do this without injury to the spring flowering plants and bulbs which they may contain. Many of the latter, such as Pansies, *Violas Forget-me-nots*, *Aubrietias*, *Hyacinths*, bedding *Tulips*, &c., will now be coming into flower; the marginal plants that may be planted now may consist of such species as the variegated *Ajuga reptans*, *Arabis albida*, *Antennaria tomentosa*, *Achyrocline Sandersoni*, *Centaurea ragusina compacta*, the variegated *Dactylis glomerata*, *Gnaphalium tomentosum*, *Stachys lanata*, *Santolina incana*, *Veronica incana*, *Cerastium tomentosum*, *Polemonium coeruleum variegatum*, and others of a similar kind, all of which are quite hardy; and, if planted out now or before long, will be well established by the time the summer bedding plants are planted out. Many plants which are not considered sufficiently hardy to withstand the rigours of some of our winters, and which may, as a precaution, have had some slight protection accorded them, should, in most cases, have such coverings removed now, or the young growth will be likely to become blanched and attenuated. Continue to increase the stock of bedding plants of all kinds, and pot off singly the various sorts of bedding *Pelargoniums*. If pots are scarce or accommodation limited, some of the more free-growing green-leaved kinds may be taken out of their pots or store pans, and have their roots wrapped separately in Moss, in which is enclosed a little light rich turfy soil. The Moss should be tied loosely round with a piece of worsted or shred of bast, and the plants should be plunged in a bed of light sandy soil or leaf mould in a cold pit or frame, but not too closely together; then give them one good watering, and keep the structure close for a few days or until the roots are found to have laid hold of the Moss, which they will readily do; when that is the case they should have abundance of air and water, as may be required; and at planting-out time they may be moved into the beds with good balls of earth adhering to them. Plants thus treated will be found to succeed quite as well as those turned out of pots. *Calceolarias*, *Verbenas*, and other bedding plants may be treated in the same manner, only in their case the Moss may be dispensed with.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Indoor Fruit Department.

Vines should now be planted, for the operation must not be delayed until the buds are breaking, or a check will be given to the tender growth, and to avoid this, every care should be taken. The young canes should be the best that can be obtained of last season's growth, and they should be turned out of their pots on the spot in which they are to be planted. The soil should be nearly all shaken from the roots, and every coiled fibre must be laid straight, so as to run away from the base of the stem instead of encircling it as they do while in the pot, and any long roots that are wanting in fibre may be cut half-way back. When the roots are set in the border they should be thrown out in all directions, but where the border is only one-sided the greater part of the roots should be set in the direction from which their support is drawn. An inch or two of the finest soil should cover the roots, as the round lumps do not fit in about the small rootlets well, nor are they so easily penetrated. Where it is desired that the roots should all remain in the outside border the Vines must be planted entirely outside, close to the ground level of the front sashes, where a round hole, a few inches in diameter, must be made opposite every Vine to let the cane through into the inside. I am in favour of having a border both inside and outside, and of planting the Vines inside and letting the roots go out, if they will, by archways along the foundations of the house. Whether inside or out, the roots should be watered after they are covered with soil with water at a temperature of 90°. Those planted inside need no immediate attention after this; but, when planted outside, the ground for a radius of 3 feet round the plants should be mulched with about a foot of rough stable litter. This, in case of cold weather, keeps the soil in a comfortable state, but it must be removed before it affects the roots by drawing them. The distance between each Vine must be regulated by the manner in which it is intended to train the rods when they grow up. Where a modification of the extension system is to be followed, and two or three rods from

each root are taken, the plants should be from 5 to 6 feet apart; but, where only a single rod has to be taken from each root, 2½ feet is quite sufficient. More plants are required to plant a house on the restricted than on the extension system; but, where young Vines are planted at the widest distance apart, an intermediate one should be planted between each. This latter subject should be a fruiting cane, one which would fruit as a pot Vine if kept in the pot throughout the summer, as it will do if planted out, so that a crop of fruit may easily be obtained in the "young Vinery" the same season as planted. A span-roofed Vinery, with a full inside border and an outside one only at one side, as circumstances sometimes necessitate, should have the one-half of the Vines planted outside to derive their nourishment exclusively from the outside border, and the other half should be planted inside, so that the chances of subsistence may be equally divided. The generality of canes, which are from 4 to 6 feet in length, should have all outside buds rubbed off, retaining four inside, to which the canes should be cut back, and the wound plastered over with a styptic; the four buds left will soon break freely. Another method which may be practised by those who may be afraid to risk the chance of growth with four buds, is not to cut any from the top, but allow all the buds to break and grow for an inch or so, and rub the small growths off from the point downwards until the desired number is reached, when the budless top may be cut off as soon as there is a strong current of sap flowing up the growing shoots.

Pines.—Old roots and stems of valuable shy-producing sucker sorts, of which the smooth Cayenne and Charlotte Rothschilds are types, which may be lying about after the general shift, should not be thrown away. When placed in cutting boxes or pans, and covered over with loam, many of the eyes burst, and grow into fine suckers, if started in a bottom-heat of 90°. All the leaves require clearing from the stem before laying them in, and the root may be cut off also. Sometimes the suckers may be so small as not to be fit for removing them from the stem. In this case, the leaves should be cut back to within 3 inches of the stem, without disturbing the sucker; and lay them closely together by the root, where the assistance of a bottom-heat of 80° can be given to perfect the young sucker. The corner of a bed does well for this purpose, providing there is a quantity of soil about the roots before pressing the plunging material around them. Should strong sunshine prevail at any time, for three weeks after plants have been re-potted, a slight shading with thin canvas will be of much benefit to them.—J. MUIR.

Hardy Fruit.

Owing to the severe weather which we have had, work in this department has been nearly or quite at a standstill for some time past; those, therefore, who advocate early pruning and planting, have decidedly the best of the argument this season. Finish as soon as possible all pruning, nailing, and tying, and now that the buds are so forward extra care will be required to prevent them from being injured. I would again advise that protection of some kind or other be applied to all trees requiring it forthwith. The spring season is always so changeable and uncertain that it is never safe to dispense with it. The "scrim canvas," which we use here for covering, is—next to glass—the best possible material that can be employed as a protector, as it is thick enough to resist several degrees of frost, and yet so open as to allow sufficient air and light to pass through it to the trees, should the weather necessitate the coverings remaining down for several days together. As a proof of its protecting powers, I may mention, that on the 12th of March last year, when our Apricots were in full bloom, the thermometer registered 16° of frost, and, though this was the only covering they had, they were quite safe. The blinds should always be drawn down during bright sunshine till the bloom opens, and even then during the prevalence of keen "north-easters" and snow or rain. Autumn-planted Strawberry beds should be looked over, and such plants as have been upraised by frost should be made firm. Now is a good time to plant out from the reserve stock pricked out in autumn, and where forcing the Strawberry is carried out—as it is in most places—the best and earliest runners may be had from this plantation. Any flowers that make their appearance should be at once removed, in order to induce a greater profusion of runners for early layering. As to kinds, every gardener has his favourites; and mine are as follows, viz.:—President, Keen's Seedling, Vicomtesse Héricart de Thury, John Powell, Lucas, Sir Joseph Paxton, British Queen, and Frogmore late Pine. The merits of these are in accordance with the order in which the names stand. For forcing, the best are President, Vicomtesse Héricart de Thury, and British Queen, and, taking all points into consideration, President is the best Strawberry that can be grown. Figs that have been protected through the winter may now be uncovered, taking care to have means of protection at hand if needed. The winter covering of these is, upon the whole, a somewhat questionable proceeding, as it must have a tendency to make the trees more tender than they otherwise would be if left constantly exposed, or

treated the same as Apricots or Peaches. Amongst hardy fruit few are more generally useful than the Gooseberry, and yet, how often are Gooseberry quarters neglected, and left to take care of themselves, a circumstance arising, I apprehend, from the notion (which, to a certain extent, is correct) that they will grow without attention; but, though they will do this, they will also give good returns for proper attention in the way of pruning, thinning of branches, clearing of suckers, and manuring; on frosty nights, when in flower, they are easily and effectually protected by shaking dry hay over the bushes. Never mind the litter and unsightliness so long as the fruit is safe, as it will be under such protection. Currant bushes may be covered in the same way, and with like results. Filberts, and Nuts of all kinds require but little or no pruning. We have a fine row of various kinds here, and all the attention they require is to keep them free from suckers, and the main branches from chafing one another; where that is the case, cut out at once all such branches.—W. WILDSMITH, *Heckfield*.

Kitchen Garden.

In some gardens, the larvæ of the Carrot fly is so destructive as to render the crop almost useless, especially for late-keeping purposes. Many remedies have been recommended, all perhaps more or less beneficial; but their ravages are still seriously felt in a very great many places. In some gardens, it has been found necessary to sow the Carrots on specially prepared beds, which are formed by taking out the original soil to a considerable depth, and filling in with compost consisting of thoroughly decayed leaf mould, burnt earth, &c. Where this plan cannot be adopted, I should recommend the following system of culture to be tried. Select a dry day when the surface of the ground works easily and cleanly; mark out, in a dry open part of the garden, a piece of ground of sufficient size, that has been turned up roughly during the winter. Scatter evenly over the surface $1\frac{1}{2}$ bushels of air-slaked lime, 1 bushel of fresh soot, and about 15 lbs. of common salt, per square rod of land; fork in, and, in doing so, endeavour to mix it with the soil as thoroughly as possible; and then leave the land to settle till the first or second week in April, when the ground may be rolled or trod down, and the seeds drilled in. When the plants are up and thinned out, a further, but much weaker, dressing of soot and salt may be placed on the land in showery weather, if the crops have been previously much infested; and during the growth of the crops all red or rusty-foliaged plants should be pulled out as they are sure to be attacked. In the autumn, when the crop is lifted, the same plot of land should be manured and trenched, burying the manure 18 inches deep, and turning the land up roughly. During frosty weather, when the surface is hard frozen, it should be well broken up with a pick, so as to let the frost well into it. In the month of March following, dress it again with soot, lime, and salt, in about the same proportions as formerly; and, in the autumn, manure and trench deeply again. If this treatment be persistently carried out, the same plot of land will produce good crops of Carrots for several years, when a fresh piece may be prepared in a similar way. After the first two years the dressings of salt and lime may be reduced in quantity, but Carrots will take up a good deal of those substances with benefit. The manure that is buried deeply at the first trenching is brought up to the surface at the second—or at least what remains of it; and, when mellowed by the atmosphere, is in good condition for the crop. During the past month the weather has been very unfavourable for performing the usual routine work; but now, as we shall probably have a period of genial weather, every effort should be made to make up for lost time. If it has not been done, Parsnips and Onions should be sown at once. Sow Radishes once a fortnight; Lettuce about every three weeks. A good rule to adopt with Peas is to sow again as soon as the preceding crop is through the ground. Small sowings of round Spinach may be made once a fortnight, and a small sowing of the New Zealand Spinach may be made in heat for transplanting when suitable. Walcheren and Veitch's Giant Cauliflowers should be sown on a warm border, to come into use in August. A full sowing of Leeks for transplanting for main crops should now be made. Autumn-sown Cabbages should be planted out, and a sowing made of Cocoa-nut, Enfield Market, and Atkins' Matchless. The planting of Cauliflowers under hand-lights or other protectors may be completed, but those plants intended for the open ground may remain where they can have protection till the beginning of April. All vegetables sown in heat under glass must be pricked off before they become weakened by overcrowding. Cauliflowers, Lettuces, Celery, Tomatoes, Capsicums, &c., must have attention to bring them forward and properly harden them off for planting at their proper seasons. Whenever the surface is dry use the hoe freely amongst growing crops; draw a little more soil to early Cabbages; finish making new plantations of Horseradish and Jerusalem Artichokes, and see that Box or other live edgings are free from weeds, as they will soon grow and, in the case of Grasses, soon seed.—E. HORDAY.

ROYAL HORTICULTURAL SOCIETY.

THE adjourned annual general meeting of this Society was held on Tuesday last, under the presidency of Lord Bury. An amended report was submitted from the Council, which stated that since the first report had been drawn up the position of the Society's affairs had materially changed. The speech made on behalf of the Royal Commissioners at the last meeting was so favourable in character, and conveyed utterances so satisfactory to the Society, that the Council felt it incumbent upon them to omit from the report any passages which might present even the appearance of disunion between themselves and the Commissioners in question. The chairman detailed what occurred at the last meeting, and which led to the withdrawal of the report then presented. He also read a letter from the Commissioners, dated the 8th of March, and signed by Major-General Scott, stating that the Commissioners were perfectly satisfied as to the legal position and status of the present Council, and were willing to open friendly relations with the Society. The chairman then commented upon the horticultural position of the Society, which he considered eminently satisfactory. He believed that the Society could get out of its liabilities if the Fellows would agree with the following recommendations of the appended report:—"The attention of the Fellows is specially called to that fact that, unless the rent of £2,400 is paid to her Majesty's Commissioners next year, the lease of the South Kensington Gardens may be forfeited, and, to prevent this contingency, an increased revenue must be obtained. This increased revenue, the Council suggest, may be obtained by concerted action on the part of the Fellows, whether resident in the neighbourhood or not, and by increasing the number of Fellows. The Council are prepared to invite a general meeting of the Fellows to discuss this question in detail. A definite scheme will then be submitted for consideration. The Council beg to express their unanimous opinion that it is the bounden duty of the Society to do its utmost to retain the Gardens in its possession, as 'a suitable area in which they may exhibit and display the progress of horticulture,' and also to enable them to fulfil the Society's obligations to their life Fellows and their debenture-holders; and, in such a course, the Council feel sure they will have the hearty and cordial co-operation of every Fellow of the Society." He concluded by moving the adoption of the report. Mr. Guedalla said the income last year showed a deficiency of £2,400; and that amount, he thought, could be wiped off by a ball under distinguished patronage. He advocated the retention of the skating rink as a source of income. The Rev. C. P. Peach moved an amendment to the report, that the meeting be adjourned in order that the report be referred back to the Council, so as to enable them to prepare a scheme of arrangement with her Majesty's Commissioners, and to report the same to an adjourned meeting. Mr. Quilter seconded the amendment. The Chairman said the Council would look upon the amendment as a vote of want of confidence, as he believed that, if the report was refused, the Society would be on the high road to ruin. The Council were ready to name a day for the discussion of the terms of an arrangement with the Commissioners. After considerable discussion the amendment was withdrawn, and the report was adopted unanimously. Mr. Horton then moved that the meeting be adjourned for six weeks to receive a statement from the Council on the subject of a scheme of arrangement with the Commissioners. Dr. Masters seconded the motion, and on a show of hands it was negatived by a considerable majority.

THE FUTURE OF THE ROYAL HORTICULTURAL SOCIETY.

I OBSERVE, in your last week's issue, a letter in which Mr. Wilson sets forth his pet crotchet about "guinea Fellows," and seems to think that, if his scheme is carried out, a large number of gardeners in the country will subscribe a guinea each. I feel pretty sure that Mr. Wilson's prediction would never be realised, even should his scheme be adopted, inasmuch as there are very few gardeners who have guineas to spare. If Mr. Wilson will examine the subscription list of the Gardeners' Royal Benevolent Institution, he will see how many gardeners there are who subscribe to that truly excellent institution; and it does seem to me a lamentable thing that so few of the craft subscribe to an institution from which, should misfortune unhappily overtake them, they would derive substantial benefit. But what I wish to refer to more particularly is Mr. Wilson's allusion to Manchester as a "test place" for the adoption of his scheme. I presume he means that the pulse of the Manchester people should be felt to see how many guineas they are disposed to give to the Royal Horticultural Society. Is Mr. Wilson ignorant of the fact that there exists a society in Manchester, called the Botanical and Horticultural, who distribute annually, at one exhibition, about £1,000 in prizes, and whose programme for the present year embraces the following:

—Floral meetings at the Town Hall, on the 16th March and 27th April; national horticultural exhibition, in May; exhibition of American plants, in June; show of Roses and floral table decorations, in July; exhibition of Carnations, Picotees, and new plants, in August; and an autumnal exhibition of fruits, vegetables, and flowers, in September? It seems to me that Manchester would be a most unfortunate test place. The Royal Horticultural Society paid a visit to it in the year 1869, and, owing to the indiscretion of those who had the management of the affair, cut a very sorry figure. I hope, however, that something may yet be done to make the Royal Horticultural Society a national institution.

A. B.

KEW AND SIR JOSEPH BANKS.

A TRUER figure than Mr. Elwes' would be that the "letter" to which he refers was "a stone put in to stay the fall of the botanical department at the British Museum." No one would feel more pleasure than myself in the achievements at our grand national *hortus vivus* at Kew, if the experiments on living plants supporting the actual status of botanical physiology, and its practical results, had been there carried on. To divert from the national *hortus siccus* at Bloomsbury its proper supplies seems a poor substitute of action. The idea of a national collection of living plants within easy reach of London, and of a national herbarium within the metropolis, with their respective and distinct applications, will commend itself to the political economist appreciating the advantage of "division of labour." The realisation of the idea, to the extent to which he was enabled to effect it, adds honour to the name and memory of Joseph Banks. Idle gossip, possibly scandal, about bye-gone times at Kew, bears no relation to the actual crisis; but may be safely indulged in now that the great ones assailed have passed away far beyond and above it.

RICHARD OWEN.

Mr. Elwes has sent you (p. 208) a quotation from Dean Herbert's "Amaryllidaceæ," containing a violent attack on Kew in Sir Joseph Banks's time; but, in justice both to the Dean and to Kew, he should have further quoted the remarks in the Appendix, p. 410, "I observe that I have incautiously admitted a stronger expression concerning the unpopularity of the principle on which those gardens have been conducted than I should wish to have used." I am glad to read Mr. Elwes' vigorous championship of the present management of Kew, and I thoroughly endorse all that he has said. I believe I speak with a longer experience than Mr. Elwes, and I can say that nothing can exceed the liberality of the present management, either in the distribution of plants or in giving information and advice.

Bitton Vicarage.

HENRY N. ELLACOMBE.

Mr. Elwes seems to think that all plant collectors should send their duplicates to Kew; but why, let me ask, does not Kew send out collectors herself, and thus help us in searching out the hidden riches of Flora in different parts of the world? At present, as much money is spent every year on the "bedding out" system as would pay the expenses of a good botanical collector. Is it that the unknown plants of the world are not worth seeking for, or, is it more important to please the many by making the garden easily understood by those who have a fancy for showy patterns?

J. CROUCHER.

Sunken Boilers.—Your correspondent "A. D." (p. 212) will, I think, make a great mistake if he tries a boiler above the level of the flow-pipe for heating several houses upon different levels. It has often been asserted that such an arrangement would work satisfactorily, but I have not met with a single instance in which it did so, even at the cost of severe firing. Mr. Williams (p. 188) speaks of one house, 140 feet long, being heated by a No. 3 tubular boiler; but this sized boiler, if properly set in the usual way, ought to easily heat 850, or even 1,000, feet of 4-inch pipe. Has he so much pipe in the one house, and does his experience extend only to the instance quoted? Again, may I ask Mr. Hobday (p. 188) if the pipes in the houses (query, how many?) to which he refers are on different levels, or only slightly deviating from a general level; can he speak positively to no extra consumption of fuel now the boiler is raised, and will he kindly say where the "other instances" are to be seen? If within twenty miles of London, I shall be happy to make a special journey to inspect them. This I do know, and assert (and I believe that all hot-water engineers of any experience will endorse the statement), that the lower the boiler is, the more rapid the circulation, and the less the fuel consumed—the two main objects in all good heating apparatuses. Are these, therefore, not worth the small cost of making a stokehole water-tight.—R. S. DUNBAR, *Thames Bank Iron Company.*

NOTES AND QUESTIONS—VARIOUS.

[Many notes and answers, obligingly sent us by correspondents, are unavoidably omitted this week from want of room.]

The Sweet Capsicum.—What is the fresh sweet Capsicum, known in Spain as Bichos, or Pimientos dulces? No doubt some correspondent of THE GARDEN will be able to tell me where I may procure seed of these.—J. B.

Scilla bifolia near London.—Messrs. Barr & Sugden have at present in full flower in their bulb grounds a very showy bed of this Squill. The fine mass of intense blue which it produces is strikingly beautiful, and as it is a Squill that will grow well in nearly all kinds of soil and situations it is a plant desirable, not only for garden cultivation, but also for naturalisation.

Disrooting Camellias.—Allow me to ask Mr. Gadd what he gains by cutting away the roots of Camellias, even such as "are as thick as one's arm," previous to planting out as he advises (see p. 198)? Does he imagine that Camellias which have been confined in tubs and pots have too many roots? and what, in the place of the roots thus removed, supports the young growth of the present season, shortly ready to start?—T. BAINES.

Lettuces through the Winter Without Glass.—I have forwarded for your inspection two Lettuces as samples of what we have been cutting daily all winter. The variety is the Black Seeded Brown Cos, which was sown on the 3rd of August last and afterwards planted on good land. They have withstood this trying winter, protected merely by Fern or Bracken. For salads they are here greatly preferred to Endive.—R. GILBERT, *Burghley.*

Oncidium Weltonii.—We have just seen an exceedingly fine spike of this Orchid cut from a plant grown by Mr. Copeland Capper, of Leyton. It contained five single flowers on its upper part, three upon a short branch below them, and three other branches with four flowers on each, constituting a bold, showy inflorescence of twenty blooms. It is probably the finest specimen of this Oncid that has yet been produced.

Destroying Slugs.—For this purpose no dressing is so effectual as lime. I dust the ground all over, as well as the plants, every three or four days if the weather is wet, or if dry once a week, and usually two or three dressings are sufficient to save most crops; but, should the depredations continue, I persevere in the lime-dustings, stirring the ground with a hoe previous to applying them. The lime should be quick, but reduced to a powder, as it will be after a few days' exposure in a shed.—P. S.

Water Cresses Without Water.—The late frosts have deprived us, for the present of these purifiers of the blood. Some years ago, the late Sir Joseph Paxton told me that he used to grow them at Chatsworth, under a north wall, upon which the rays of the sun never fell, and that in this way a certain supply might be depended upon in the worst winters. If some enterprising grower for the markets would take the hint, and prepare for next winter, he might make a good thing when frost makes Cresses grown in water flabby and uneatable.—W. T. P.

Grafting Hardy Azaleas.—When should I graft Ghent Azaleas, which is the best stock on which to put them, and how should I afterwards treat them?—A. J. [Dr. Woodman, of the Exeter Nursery, states that Azalea pontica is found to be the best stock on which to work Ghent Azaleas. They are usually grafted in the spring, splice grafting being employed for the purpose. After grafting they are plunged in cases in the propagating-house, where they receive the same treatment as is given to Rhododendrons. The freer and commoner sorts are usually layered in the open ground in the autumn.]

Tomatoes under Glass.—Tomatoes now-a-days have become a standard vegetable, but they require to be grown under glass, even in the sunny south, to yield profitable results. They may be sown in January, grown in pots or planted out in a back border of a Vinery, where I have known them to do well, and where they form a continuation to the earliest pot supply. Last season I saw good results obtained by leading the plants into a pit, from a border in front, the fruit, which were supported in the stage, swelled to a large size. Hathaway's Excelsior is much superior both in flavour and appearance to older varieties.—R. P. B.

How should American Cranberries be Grown?—Perhaps some of your correspondents could afford me some information respecting the best mode of growing American Cranberries. Having a considerable surface of very moist ground, sloping towards the south, without trees to shade it, but protected in some measure by a wood of Hazels, &c., I am induced to try the growth of Cranberries. The ground is kept moist by the overflow of three or four pools led through 2½-inch drain pipe, which could be branched in any direction if required. If large masses of rooty peat were placed contiguous to each other probably the plants would do very well, but I should be glad to have more correct information. The Cranberry is extensively grown in America, and is used as a part of almost every meal. Any hints on the above subject would be greatly appreciated.—E. W. COOKE, *Glen Andred, Sussex.*

Forcing Rhubarb.—Many have an idea that Rhubarb raised in the dark is much more delicate than when otherwise grown. So it is, but the delicacy is obtained at the expense of flavour. The idea is a fashionable one, that is all. A few years ago I put some roots of Rhubarb at forcing time into my Mushroom house, and some others into a bed in my propagating-house. This was grown in the light, was ready first, and was used. When that in the Mushroom-house was ready, I took it in; but, a day or two after, I was instructed to bring in the old sort, if there was any, because the last had not so much flavour. I now grow my forced Rhubarb in the light. I am quite aware that a slight covering in the open ground in the spring and summer increases the beauty of the appearance of Rhubarb, and perhaps then of its flavour, but in winter it is better exposed to the light.—N. H. P.

Coprosma Baueriana variegata.—Your correspondent, Mr. Muir, asserts (see p. 172) that this has a dwarf and somewhat creeping habit; but, according to my experience, it must be kept neatly pegged down, otherwise it presents a very straggling appearance. I have seen plants of it, when not stopped, grow as high as 6 or 7 feet; therefore I cannot see how a plant, naturally so tall, can be said to have a dwarf and somewhat creeping habit. Mr. Muir also asserts that it is difficult to propagate, and I must admit that it is so; but, by following the plan which he suggests, success will be almost certain to be the result. The question, however, is, have we room in our propagating beds (especially at this season of the year) to admit of that plan being carried out? I doubt it. A method which I find to answer well is, when selecting the cuttings, to take a good heel off the old wood along with them; then to fill the pots two-thirds full of crocks, on which should be put a little light rich compost and a layer of sand. The cutting should then be inserted, watered, and plunged in a brisk, moist bottom-heat, taking care to give them only a very slight sprinkle overhead until rooted, otherwise they will damp off.—J. SIMMONS, *Warwick.*

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

MR. GORDON'S PINETUM.*

WE heartily welcome a new and extended edition of this interesting and useful work, the former edition of which has been for some time out of print. A supplementary volume, published in 1862, which had become necessary in consequence of the frequent introduction of many new species, and endless varieties, causing what the author in his preface called a Babylonian confusion of names, which urgently required such rectification as was practicable, is also out of print. That supplement, combined with an accurate account of still more recent introductions, is embodied in the present solid and practically useful volume, which is rendered all the more valuable by Mr. Bohn's index of "popular" names. The addenda bring the contents of this volume up to the present hour, so to speak. Among new Conifers a variety of Norfolk Island Pine (*Araucaria excelsa speciosissima*) is described. Its distinguishing characteristics are greater hardiness than that of the ordinary Norfolk Island Pine, and the remarkable length of the leaves, in which particular, however, it closely resembles *A. Cunninghamii*. Then there is *Cryptomeria japonica*, considered to be the original form of the Japanese Cedar, found in the north of Japan, and differing from the one originally introduced by Mr. Fortune in having a more compact habit of growth, and not in being subject to turn so brown in the winter. Also a variety of Gowan's Cypress, called *Cupressus Goveniana glaucescens*, raised by M. Sahul, of Montpellier. This is of a light and almost blue glaucescent character, and by its use fine contrasts of colour may be produced in plantations where Conifers play a conspicuous part, as the hoary-blue tint of its foliage will prove of great value in producing masses of light-toned foliage. The effect of the contrast, just suggested, may be varied by a beautiful new variety of *Cupressus Lawsoniana* (Lawson's Blue Cypress); a novelty like the last-named, raised on the Continent. It has the advantage of always retaining its greyish-blue tint, shaded with deeper grey, summer and winter. Another interesting variety of the Lawson Cypress, as stated in Mr. Gordon's addenda, has been raised by Mr. Barron, of the Elvaston Nursery. In this the young shoots, and also the young wood, are of a bright canary-yellow, a colour not impaired either by the sun's rays in summer or the frosts in winter. A new Juniper is also described, which appears to have great attractions. It is a sport from the male form of the original plant, and has all the more prominent portions of the foliage suffused with a rich golden colour, which retains its bright auriferous tint both in winter and summer. A new golden Yew is also described, in which the younger branches are of a bright orange colour. In winter it is by far the most brilliant of any of the golden varieties. By way of contrast with these light grey and golden Conifers, an unusually dark toned *Arborvitæ* is described under the name of *Thuja gigantea atrovirens*; for such contrasts as those suggested this will be most valuable. It will thus be seen that Mr. Gordon's volume contains very interesting information in reference to the latest novelties in the way of Conifers, while its main bulk is devoted to complete descriptions of all the hitherto known species of that interesting tribe, many of which have not been utilised to anything like the extent which their merits deserve. Among Spruce Firs alone, many will be found described which have not as yet had a chance of displaying their picturesque and valuable characteristics in this country. Take, for instance, the Alcock Spruce (*Abies Alcocquiana*), a kind named in compliment to Sir Rutherford Alcock, the British Minister at the Court of Yeddo, who discovered it on the Sacred Mountain, Fusi-Yama, on the island of Nippon, where it formed noble trees from 90 to 100 feet high, at an elevation of 7,000 feet above the level of the sea. This fine tree was introduced by Messrs. Veitch in 1861. There is also Engelmann's Spruce, which attains as great a height on the mountains above the Colorado River, and also on the highlands of Santa Fé, in New Mexico, as the Alcock Spruce. In strong contrast to these giants, again there is the Pigmy Spruce (*A. excelsa pygmæa*), the dwarfest of all Firs, scarcely a foot high, which is not so often seen as it should be. Altogether, there are twenty distinct kinds of Spruce Fir fully described, seventeen Cypresses, besides a number of distinct and beautiful varieties; and the same may be said of the Junipers, the Larches, the Pines (of which ninety-two kinds are enumerated), the Silver Firs (*Picea*), and every other kind of Conifer—among

which planters will find abundant variety. Valuable and interesting as Mr. Gordon's volume must be admitted to be, it contains, however, a few blemishes, which, though comparatively unimportant, it will be well to amend when a new edition is called for. As an example of the kind of shortcoming alluded to, we may instance the description of the well-known Stone Pine (*Pinus Pinea*), the account of which, gathered from various sources of information, is somewhat carelessly put together. The general aspect of the Stone Pine, which forms one of the great charms of Italian landscape is, as is well known, that of a towering, branchless trunk, attaining the height of from 50 to 70 feet, surmounted by a spreading canopy of dark foliage, a character which our landscape painters, from the time of Turner, have turned to glorious account in their Italian compositions of both mountain and villa scenery. How are these characteristics to be made to accord with the following disjointed account:—"A low growing tree, with a round bushy appearance, from 15 to 20 feet high. . . . It is cultivated throughout the whole of Italy. . . . It forms a very ornamental small tree, with a rounded head, so celebrated for producing a fine effect in Italian villas." The last remark shows that there is no mistake as to the kind of Pine intended to be described, which is further corroborated by the observation, in another part of the description, that its seeds, or nuts, form an extensive article of commerce in Italy and the South of France. In another place, the full grown height is described as 50 or 60 feet. These inconsistencies and contradictions may be easily amended; as well as such slips of the pen as that which describes the Stone Pine as attaining a height of 2,000 feet, when the author meant to say that it thrives well at that elevation. These slight imperfections, however, in no way impair the practical usefulness of the book, nor the vast amount of valuable information which it contains on the subject of cone-bearing trees. The value of Mr. Bohn's index is very great, and, written by him in his eightieth year, adds another to the many evidences of his knowledge and industry. The following is an example of the way in which it is arranged, except that, for the sake of space, the names are run together, instead of being in the usual form:—*Abeto. Italian. Picea pectinata. Common Silver Fir.—Abyssinian Juniper. Abyssinia. Juniperus procera.—Acuminate Swan River Cypress. Actinostrobus Acuminatum.—Adventure-Bay Pine. Tasmania. Phyllocladus rhomboidalis.—African or Atlantic Cedar. Atlas range N. Africa. Cedrus Atlantica.—African Cypress. Madagascar, etc. Widdringtonia.—Agath-Tanne. German. Dammara Orientalis. Amboyna Pine.—Agrion Elaton. (Wild Fir.) Cephalonia. Picea Apollinis. Mount Enos Fir.—Aka-Matsu, (Red Pine.) Japan. Pinus densiflora. Dense-flowered Japan Pine.—Ak-cherschal. Tartary. Picea Pichta. Siberian Silver Fir.—Alcock Spruce. Japan. Abies Alcocquiana.—Aleppo or Jerusalem Pine. Sicily and Greece. Pinus Halepensis.—Alerce. Barbary. Callitris quadrivalvis. Jointed Arbor-vitæ.—Alerce. Spanish. Pinus Larix. The Larch.—Alerce. Chili and the Cordilleras. Libocedrus tetragona. Tetragonal Arbor-vitæ. H.*

Pitcher Plants at Drumlanrig.—In a description of the *Nepenthes*, at Drumlanrig, by Mr. Muir, a short time ago, he mentions dozens of Pitchers of *N. distillatoria* that would hold a pint. Now, if this is really a fact, it would be interesting to many who, like myself, take an interest in these plants, to learn something of the treatment under which such results were produced. It certainly is not the rustic baskets, of which Mr. Muir speaks, that has caused them to attain such a size; for, tasteful as is the appearance of these, the plants do not acquire in them that strength and vigour which they do in pots. Pitcher plants are spare-rooting subjects, and the points of the feeding roots protruding to the outside of the baskets perish; this I have long ago proved by experience. I have been fairly successful in the cultivation of *Nepenthes*, as many who have seen my plants can testify. I have also seen most of the best grown collections in the country, but, with two exceptions, I never yet saw Pitchers of any variety, not even of the largest species, *N. sanguinea* and *N. Rafflesiana*, that would hold a pint. I have seen numbers that were said to do so, but which, when they came to be tried, generally held much nearer half-a-pint than a whole one. The two Pitchers, of which I speak, I now have in a dried state, and, when cut from the plant, one held an imperial pint and the other a small wine-glassful over a pint. But these were not grown in a way to fairly illustrate the best cultivation. I had a remarkably vigorous plant in a 9 or 10-inch pot, with two extraordinarily strong shoots, some 3 feet long, for a purpose wholly apart from any intention of producing large Pitchers. In the middle of the growing season I nipped out the points of the shoots just above a couple of strong leaves in course of formation, and at the same time all the eyes were cut out from the top of the shoots down to within a few inches of the base; this, therefore, threw all the strength of the plant into the two top leaves, and the two Pitchers referred to were the result.—T. BAINES.

* "The Pinetum: being a Synopsis of all the Coniferous plants at present known, &c." By George Gordon, A.L.S. H. G. Bohn, Henrietta Street, Covent Garden. 1875.

NOTES OF THE WEEK.

— THE rare and beautiful *Tulipa Greigi* was shown in good condition at South Kensington on the 17th inst., by the Colchester Seed and Bulb Company. It has thick waxy foliage of a glaucous hue, blotched with purple, and the flowers are golden-yellow without, bright crimson within, and have a large feathered blotch of deep velvety-black inside, near the base of each segment. It is a native of the Caucasian Mountains, and is well worth the attention of all lovers of hardy early-flowering showy bulbous plants.

— THE new *Phalenopsis Veitchii* is now in flower in the Royal Exotic Nursery, at Chelsea. It is supposed to be a natural cross between *P. rosea* and *P. Schilleriana*, having the speckled foliage of the last-named plant, and flowers intermediate between the two species, both in point of size and colour. Two fine specimens of *Dendrobium Wardianum* are also in flower, in the same establishment, and there is a very good display of forced white Lilac, Tea Roses, and home-grown Lily of the Valley.

— AT the last meeting of the Royal Horticultural Society, at South Kensington, Mr. E. Bennett, gardener of the Marquis of Salisbury, at Hatfield, showed a cut spike of the well-known *Hedychium Gardnerianum*, bearing fruit, the crimson covering of which, interspersed among the brilliant orange-tinted ruptured capsules, had a pretty effect. In order to secure this the old flower-stems should be allowed to remain and bear seeds, instead of being cut down, as they usually are, as soon as the beauty of the blossoms is over.

— DR. R. A. PRYOR intends publishing a new "Flora" of Hertfordshire, and to enable him to make it as complete as possible, he has issued a circular containing lists of plants respecting which further information is needed. Critical species will be thoroughly studied out. Webb and Coleman's "Flora Hertfordiensis" (1849), supplements to which appeared in 1851 and 1859, is a good work, and the only "Flora" of the county hitherto published; but so much has been done in critical botany of late that it is, in this respect, out of date.

— WE learn that the export of *Cinchona* bark from the Neilgherry hills, on the part of the Government, during 1872-73, the first regular year of export, amounted to over 20,000 lbs., which realised £4,000 in the London market. It is anticipated that the returns of the exports for the past year, 1873-74, would show a similar quantity, and that the trade in future years will rapidly increase. Bark from private *Cinchona* plantations in the East Indies and Ceylon appears regularly in the London market, fetching from 10d. to 4s. per lb. "Very good average prices," it is said, "as compared with those obtained by the South American barks."

— THE International Exhibition of Fruit and Flowers, to be held at Edinburgh on the 15th and 16th of September next, is, we are glad to learn, likely to prove one of the most successful of the great autumn fruit shows held of late years. The Committee have met with liberal support from the residents of the city and its vicinity, and the schedule of prizes has been issued. The prizes are of the most liberal character, as, for example, a first prize of £10 is offered for eight varieties of Grapes, one bunch of each; a first prize of £16 for collections of sixteen dishes of fruit; and one of £10 for twelve dishes. Pine-apples, Pears, Apples, and other fruits also receive liberal encouragement. Amongst the special prizes offered, we observe that Messrs. Sutton and Sons offer prizes for Melons and Cucumbers; Messrs. Boyd, horticultural builders, of Paisley, a silver cup for a stand of Grapes consisting of six varieties; Mr. Monro a series of prizes for Cucumbers; and Mr. Horsburgh a portfolio of photographic views of Abbotsford, of the value of £5 5s., for the best Palm. For particulars of the prizes, conditions of competition, and other information, we must refer our readers to the schedule.

— BOXWOOD, which is almost exclusively used for wood engraving, is becoming more and more scarce. The largest wood comes from the countries bordering on the Black Sea. The quantity exported from Poti direct to England during 1873 amounted to 2,897 tons, of the value of £20,621; besides this, from 5,000 to 7,000 tons of the finest quality, brought from Southern Russia, annually pass through Constantinople. An inferior and smaller kind of wood supplied from the neighbourhood of Samsoun is also shipped at Constantinople to the extent of about 1,500 tons annually. With regard to the Boxwood forests of Turkey, the British Consul at Constantinople reports that they are nearly exhausted, and that very little really good wood can be obtained from them. In Russia, however, where some little Government care has been bestowed upon forestry, a considerable quantity of choice wood still exists; but even there it can only be obtained at an ever-increasing cost, as the forests near the sea have been denuded of their best trees. The trade is now entirely in English hands, although formerly Greek merchants exclusively exported the wood. In the province of Trebizonde the

wood is generally of an inferior quality; nevertheless, from 25,000 to 30,000 cwts. are annually shipped, chiefly to the United Kingdom.

— A CLUB, to be called the Lindley Club, was inaugurated the other day, and is intended to serve as a bond of union among horticulturists, both for social purposes and for the promotion of their respective pursuits. The subscription is 10s. per annum.

— It is understood that the endeavours which have for some time past been made to procure a public park for Wolverhampton are becoming more satisfactory, and that it is probable that the Old Merridale Estate, consisting of 70 acres of land, will be transferred to the Corporation before long. Wolverhampton is certainly much in need of some place of recreation free from the smoke of the town.

— THE botanical productions of the Queensland North-East Coast Expedition are important from an economic point of view. Extensive districts, the soils of which cannot be surpassed in quality, and which support a truly tropical vegetation, including the Bamboo, Tara, and Banana, have been discovered. In some places, too, the timber trees were very fine, particularly of *Calophyllum*, *Inophyllum*, *Eugenia grandis*, *Terminalia melanocarpa*, *Hernandia ovigera*, *Cardwellia*, *Cedrela*, *Alstonia*, *Castanospermum*, and others.

— A NEW Hybrid Perpetual Rose, named *Hippolyte Jamin*, was exhibited, and received a first-class certificate, at the meeting of the Royal Horticultural Society, on the 17th inst., by Mr. Bennett, of Stapleford. It appears to be robust in habit, and has fine waxy foliage. The flower is well filled with stout smooth petals, the colour of which is a rich rosy-purple. The value of a Rose can scarcely be judged from forced blooms, but this one seems likely to become a favourite.

— THE "Kölnische Zeitung" reports that besides *Phylloxera* and the Colorado Beetle a third noxious insect has come over to Europe from America; it is the so-called Blood Louse, which causes much damage to Apple trees. As a practical remedy against this unwelcome guest, it is recommended to paint the young tree with naphtha and lime-water. With larger trees, of course, this is impossible; but it is said that if during winter a thin lime paste is placed in a circle round the tree where it comes out of the ground, the ova of the Blood Louse are then completely destroyed.

— It is proposed to plant extensively the Red Cedar in Bavaria. The superiority of the wood of this tree (*Juniperus virginiana*) over all other kinds of Cedar is well known, and the demand for the wood in Bavaria, where immense quantities of lead-pencils are made, has induced some manufacturers to take up the question of the acclimatisation of the tree in that country. Seeds have been sown in the Royal Forest, and about 5,000 young plants have been grown on one private estate: the cultivation of the tree is also being attempted in other parts of Germany.

— MESSRS VEITCH & SONS have just now an unusually fine display of bulbous and other spring-flowering plants in their nursery in the King's Road. Among Hyacinths are many new and distinct varieties, foremost among which may be named Gladstone, a fine single blue, in the way of De Candolle, but clear bluish-lilac; Masterpiece, a deep rich purplish-plum, excellent both in colour and spike; Prince Talleyrand, clear porcelain-blue, the bells being individually fine; and Negro, a dark variety in the way of Masterpiece, but having a much closer spike. The best single red is undoubtedly Duchess of Edinburgh, a bright pink kind, with a deeper stripe of the same colour; Baron Beust, too, is a fine single blue, something like Grand Maître, but of a much clearer tint. Disraeli, a compact single blue, is also good, and Princess of Wales is likewise a good semi-double bright rosy variety; and Oriental Beauty, a clear single buff kind, is quite distinct in tint from all other yellow varieties—to which it is a useful addition.

— EVERY week brings us another prescription, guaranteed to be infallible, to destroy the *Phylloxera*. How imperfect is the best of them the Société des Agriculteurs de France has lately shown by drawing up a petition to the Assembly, begging it to take this most important subject into consideration. There is but one mode of destruction yet suggested which really seems to answer its purpose—submerging the Vineyards for a month at least. The society declares that one-third of the French crop, reaching a yearly value of £20,000,000, is now actually endangered. In five years more, unless something be done, one half the crop will be in peril, and twenty years, at most, will ruin the wine interest of France. The spread of the *Phylloxera* is terribly rapid. There is now before the society a scheme of M. Aristide Dumont, who proposes to dig a canal from the Rhône, by which nearly 200,000 acres of Vineyard may be flooded every winter, and similar measures will become necessary all over France unless the chemists can devise some means of destruction. This fact shows how great a danger threatens—nothing less is at stake than the most important industry of France.

THE FLOWER GARDEN.

THE TUFTED SOAPWORT.

(SAPONARIA CÆSPITOSA.)

LARGE numbers of Alpine plants, remarkable for their graceful tufted appearance, and for their numerous flowers, which are usually of the most brilliant and varied colours, would be used much more commonly than they are for the embellishment of our gardens if their culture did not so frequently offer such apparent difficulties. Nevertheless, attempts commenced in an intelligent manner, and followed up with perseverance, have proved satisfactory in the case of many of these plants, and amongst them must be classed the *Saponaria cæspitosa*, of which the annexed is an illustration of its natural size. How is it possible (says the "Revue Horticole") to account for the difficulty experienced in acclimatising upon lowlands these Alpine plants? No doubt the peculiar character of the soil has something to do with it; but we nevertheless believe that the entirely exceptional climatic conditions to which such mountain plants find themselves subjected, are the principal cause of their delicate constitution, which so often militates against their successful culture in gardens. The reason that plants of elevated regions succumb so often, is, no doubt, principally owing to the sudden changes of temperature, and to the colds of winter. In their natural habitats they are very differently circumstanced, being wintered under snow, and thus enjoy an equable temperature which, thanks to this covering, never falls below zero. When the snow melts, the Alpine plants emerge from their hiding places, and no longer dread the rigours of a winter which, short as it is, would be sufficient to kill them. This difference of climatic conditions appears to us to give a sufficient clue to the difficulty attending their cultivation in gardens. The *Saponaria cæspitosa*, however, succeeds well in most places. It comes originally from the higher regions of the central and eastern Pyrenees, where it flowers in the month of August; but in the lowlands its beautiful rose-coloured blossoms are developed in the end of June. Lapeyrouse, in the "Flora of the Pyrenees," gave it the name of *Saponaria elegans*. It is perennial, and forms rosettes of linear leaves, which are somewhat thick, glabrous, and of a beautiful green colour. The flowers, which form a thick cluster, are supported on short stout stems. This graceful little plant is very valuable for planting on rock-work; a sandy soil suits it best, and it will pass the winter perfectly in the open air, without any particular care being bestowed on it.



The Tufted Soapwort.

PRUNING ROSES.

No operation in gardening has undergone so many changes of pruning Roses; and, for this, among other reasons—~~that the roses~~ themselves are very much changed. When we had few or none but Gallica, Moss, and Summer Roses, they were pruned like Gooseberries, soon after the fall of the leaf; and this answered very well, for these summer-flowering kinds were perfectly hardy and late in starting into growth, and they ran little or no risk of having their flowers blackened by late frosts. But attempts to apply the same sort of pruning to all Roses, and also to prune all at the same time signally failed. Take the case of the Banksian Rose; this, for many years after its introduction, was reputed to be a shy bloomer, and in not a few gardens it bears the same reputation still; simply because it was and often is pruned close, along with other Roses in November. Thus nearly the whole of the flowers are cut clean off. Prune the Banksian Rose early in July as soon as it is out of flower, and in May and June following it will reward you with wreaths of miniature Roses. Hence, we may infer that the different families of Roses, such as Teas, Noisettes, Bourbons, Perpetuals, Ayrshire, Boursault, or other kinds, require different modes and times of pruning—and they do. It is therefore impossible, even were it desirable, to lay down stringent rules concerning either the time or the mode of pruning. Prune, as a rule, however, weak Roses earliest and most severely, and strong Roses least and latest. The facts on which this practice is based are as follows:—The strength that would otherwise have gone to nourish a dozen or a score of flower-buds or shoots is concentrated by severe pruning into one or two, and hence their increased vigour. Consequently, if we want to weaken or moderate growth leave it unpruned or slightly cut back; while by leaving a weakly Rose unpruned, it becomes weaker still. Cut it back to a single bud, and its entire strength is centred in that bud, and, if anything will restore it to vigour, that will.

Best Time for Pruning.

The best time to prune weakly-growing Roses is as soon as the leaf falls. All through the winter the buds left are nourished, and filled fuller by the slow motions of the fluids, which are never at rest unless when frozen. This enables the buds to break with greater vigour in the spring; while, on the contrary, one of the surest recipes for moderating strength of growth, is to leave all the shoots at their full length till February, March, or even April, and then cut them back to weakly dormant buds, thin, and well-nigh empty at the base of the shoots. Thus, by late pruning there is a direct and indirect loss of vital force. The whole of the most fully nourished buds are cut clean away, which is a loss; but the buds left are crippled for lack of food, and are sure to be the weakest and worst on the shoot. It is therefore clear that a repetition of late pruning must lower the vitality and lessen the growth of the most vigorous plants. Most people have vague notions that Roses must be cut back to furnish a succession of

flowering shoots, and to prevent them from becoming bare at bottom. No doubt there are two primary purposes served by pruning; and they are best served by early or autumnal pruning. But other considerations oftener determine the time and extent of pruning than the mere furnishing of the bases of Rose trees and bushes with wood. Modern Rose-growers prune for flowers—flowers of first quality and in long succession. The season of Roses in the open air has been extended from May to November, and the wise pruner takes all this into account, and prunes from November to May accordingly, and then again in June, July, and August. Thus, to have Roses seven or eight months in the open air, he must prune nearly ten months. These three last named months, are, however, for summer pruning only. Now, while from the beginning of November to July is named as the season for winter pruning, that in April and May may be said to be suited to the China, Tea, or other tender Roses in the open air that have been partially protected. Except in abnormal cases, for special purposes, the great family of Hybrid Perpetuals should be pruned not later than February or March, but weak growers among them (if any) should be pruned in December or January. This, however, must be taken with some allowance as to habit of growth; for some of these Roses grow much earlier than others, and if such are pruned too early, the early Roses will assuredly be cut off by late May frosts.

Pruning for Safety from Frost.

But we must prune for safety as well as for continuity of bloom, the moderating of strength, and the furnishing of wood; and, no doubt, this last object has been the most important of all in altering the season of Rose-pruning. With such widely differing classes of plants to deal with, had we gone on pruning all at the same time, fully half our Roses would have been ruined by frosts that now linger in our gardens all through May, seeking what tender buds, shoots, or plants they may blacken or destroy. Almost each variety of the Rose, too, has some special peculiarity, and may need for its highest development a particular and special mode of pruning. Maréchal Niel, for instance, likes to ramble at its own sweet will, and thus shower down its golden treasures far and wide. The Gloire de Dijon can ramble also, and do well when comparatively unrestricted; but it likewise bears close pruning well. By pruning the Tea Roses as soon as each cluster of flowers on a shoot fades, we restore to them the greatest merit of the old pink China, by converting most of them into monthlies. Again, if such a short-stemmed Rose as the Baroness Rothschild, strong and stout as its stumpy shoot is, be not cut in severely, the Roses will hardly clear the leaves, but sit and rest among them. And so on and on of the endless peculiarities of Roses. Therefore, the greatest secret of successful Rose-pruning has yet to be told. It consists in putting practical knowledge into every cut. Only thus can each Rose be pruned to the best advantage, and so as to develop its fullest measure of beauty. D. T. FISH.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Rose Isabella Sprunt.—In Mr. Philip Ladds' extensive Rose-forcing houses at Bexley Heath, this Rose has been proved the freest bloomer of the many Tea Roses forced there. In other respects it is an admirable Rose for those who wish to cut blooms in winter and spring.—R.

Water Convolvulus.—Probably this name is at times applied to the hardy Water Lily (*Nymphaea alba*). The term Lily is so commonly applied to the field Convolvulus, that, by a common transposition, the term Convolvulus might be at times applied to the Water Lily.—A. D.

Localities for Alpine Plants.—As I intend to spend a month in Switzerland this summer, can you inform me what are the best localities for getting a good selection of Alpine plants?—G. W. B. [Any of the mountainous parts are certain to afford a good collection of Alpine plants, though, no doubt, some cantons are richer than others. The Engadine and the Canton of Tessin are particularly favoured in this way.]

Hardiness of the White Lapageria.—At Gunnersbury Park, near London, the hardiness of *Lapageria rosea alba* has been put to a severe test during the present winter, a vigorous shoot from a plant growing along the roof of a small span-roofed house having thrust itself through an opening in the wood-work. Though on an open north aspect, the shoot continues as fresh and healthy as those inside the house.—"Florist."

Climbing Plants for a Verandah.—I have a verandah about 50 feet long, open in front, but roofed with opaque glass. I wish to cover the back wall with about a dozen climbing plants. Will you, therefore, name ten or twelve plants suitable for that purpose? The aspect is south-east.—W. N. A. [Try *Jasminum nudiflorum*, *Passiflora cœrulea*, Maréchal Niel Rose, various Clematises and Honeysuckles (the trumpet-flowered kind being as good as any), *Cotoneaster microphylla*, *Chimonanthus grandiflorus*, *Lapagerias* (both red and white), and some of the finer varieties of Ivy, both green and variegated.—PHILIP FROST, *Dropmore*.]

Selaginella denticulata as an Edging.—Do any of your readers use this for carpet bedding? It would make a pretty edging to some of our dark-foliaged plants, such as *Iresine*, Beet, and others, and it would also make a nice carpet running amongst such plants. I planted two plants of it in the open air last spring, when they not only grew well, but have withstood 10° of frost this winter, and, although they have been twice covered with snow since, at present they are quite healthy, and are still growing. I intend planting a few dozens of this *Selaginella* this year.—JOHN CLARKE, *Cork*. [It would form a very useful mossy carpet-plant in the flower garden.]

THE LIBRARY.

FOREIGN HORTICULTURAL PUBLICATIONS.

THE "Gartenflora," for January, contains a figure of *Oxalis Ortgiesii*, a species of the corniculata section, with a stem from a foot to a foot-and-a-half high, curiously formed truncate leaflets, and yellow flowers, produced in great profusion all through the summer in the open ground at Zurich. It was collected by Roezl in the Andes of Peru. The second figure is of the dark deep-coloured variety of *Sedum spurium*, called *splendens*. This is one of the most ornamental of the trailing Sedums, and very desirable on account of its long flowering season. It is a native of the Caucasus. The third is an uncoloured figure of the *Rheum palmatum* var. *tanguticum*, which M. Maximowicz declares to be the true source of the genuine Turkey Rhubarb of commerce. It was obtained from the alpine woods near Lake Koko-nor, in north-west China, the district in which Rhubarb cultivation for the Russian trade was formerly carried on. It is not denied that *Rheum officinale*, recently figured in the "Botanical Magazine," yields a superior kind of Rhubarb, but it is argued that the plant in question is the one that furnished the drug known to the early physicians. Messrs. Flückiger and Hanbury are accused of having been too precipitate in accepting *R. officinale* as the true plant. In reality, of course, this question is of more historical interest than present importance, for the quality of the drug grown and prepared in this country is said to be little, if at all, inferior to the best imported. Both *R. officinale* and *R. palmatum* are ornamental plants, the latter especially, having elegant deeply-divided leaves. The "Hamburger Garten und Blumen Zeitung," is one of the best of the German horticultural journals which find their way to this country. It is not embellished with coloured plates, but illustrative wood-cuts are occasionally given. A large portion of the first number for this year is devoted to cultural articles, and the commencement of an enumeration of the Palms of Herrenhausen, probably the finest collection in existence. In a note on the "Roffia Grass" of gardeners, a Mr. Rothe invites us to believe in a startling "discovery" of his, that this tying material is a species of sea-weed; but this is asking too much. The February number is very good indeed on the whole, but it opens with an unfortunate article on "The Genuine Rhubarb," professedly based upon communications from Dr. Regel, the editor of the "Gartenflora." How it came about, it is impossible for us to say, but the writer speaks of *Rheum officinale* and *R. palmatum tanguticum* as the same plant! Yet they are as distinct from each other as any two species we know; and, as mentioned above, they are distinguished in the "Gartenflora." We could not believe that the editor of the latter journal was playing false with his *confrère*, and truly, we find on reading over the paragraphs given in inverted commas, that such was not the case. The writer adds, "we may probably refer to this plant again," which will, doubtless, be considered necessary; for, half-a-dozen lines further on, we are informed that "with the exception, perhaps, of the 'Californian' (N. Indian) *Rheum nobile*, this is the most beautiful species of the genus." This is followed by an interesting article on fruit-growing, especially the management of cordons. The object is to point out the advantages of the cordon system, and at the same time to give some instructions how to carry it out successfully. In Germany, it appears, this system, so universal in France and Belgium, is as slow in making its way as in this country. The writer points out its advantages, and how very easily one may learn to practise this agreeable and profitable branch of fruit-growing. Woodcuts are given in illustration, and a list of Apples and Pears suitable for this treatment. These lists being short, we may re-produce them for comparison with the sorts usually grown in this country:—Pears: *Beurré Clairgeau*, *Beurré Diel*, *Brown Autumn Beurré*, *Grey Autumn Beurré*, *Napoléon*, *Beurré Bachelier*, *Hardenpont's Winter Beurré*, *Beurré Liegel*, *Abbé de Beaumont*, *Soldat Laboureur*, *Ah! Mon Dieu!* and *Archduke Charles*. Apples: *White Winter Calville*, *Red ditto*, *Gravenstein*, *Winter Golden Pearmain*, *Herefordshire Pearmain*, *Blenheim Golden Reinette*, *Royal Short-stalk*, *Golden Pippin*, and *Ribston Pippin*; amongst *Reinettes* the *Canada*, *Ananas*, *Bauman's*, *Brittany*, *Orleans*, and *Breda*. The further contents are:—"Some Notes on my last Trip to New Grenada," by G. Wallis, which includes a list of some of the writer's principal discoveries; "Palms of the Royal Gardens of Herrenhausen" (continuation), bringing the enumeration down to *Calyptrigyne*; "Cultivated Species and Varieties of Holly"; "On the Culture of Gladioli," by F. Gloede; "Newly-introduced Plants"; "The Kostritz Dahlias," by Dr. Krause (a patriotic contribution in favour of German varieties, which are said to be equal in colour, superior in shape, if not in size, to the best English. Christian Deegen is the name of the raiser who has been so successful. The German varieties exhibit, it is affirmed, an improvement in habit, and especially in their earlier flowering season

(many of them being in full bloom in June); "New Echeverias, Descriptions of the Hybrids raised by Deleuil;" &c.

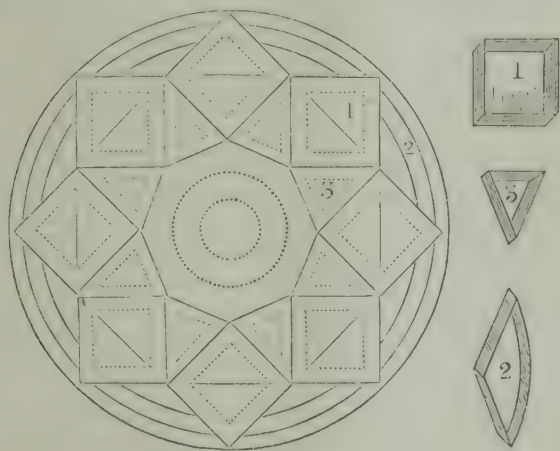
The Kitchen Garden.*

Of late years the Belgian Government has given much encouragement to all classes of cultivators, and corresponding progress has been noticeable in some branches of horticulture. The complaint is, however, heard amongst Belgians themselves, that kitchen gardening, notwithstanding its lucrative character, has not advanced in the same proportion as other departments; let us therefore hope that the second edition of the "Jardin Potager," which is published in Belgium, and is the work of M. H. Spruyt, may be the means of remedying this defect. The book is carefully and concisely written, and the directions and descriptions, without being too diffuse, are sufficiently ample to be intelligible. It deserves a wide circulation, for, within its 612 pages, an immense mass of useful information is to be gained.

The "Revue de l'Horticulture Belge," the first number of which appeared this month, is another valuable addition to the monthly horticultural journals of Belgium. In addition to two excellent coloured plates—one of the beautiful Rose, Gloire de Ducher, the other, a remarkably good representation of the true and false Colorado beetles and their larvæ—the number contains several neatly-executed wood-cuts, one of which, illustrative of an article upon

Moveable Flower-beds,

we consider of sufficient importance to transfer, together with the description, to our columns. The idea of forming these moveable flower-beds by means of compartments or pans made either of earthenware or zinc was realised the year before last for the first time by Mr. Schliessman, of Castel, at the horticultural exhibition at Darmstadt. The invention is a peculiarly ingenious one, the value of which will doubtless be fully recognised before long. The accompanying cut shows only three sorts of pan, each to contain a



Moveable Flower-beds

distinct kind of plant. No. 1, of a square form; No. 2, having one of its sides a little rounded; No. 3, of a triangular form. It is expected that the most diverse combinations may be effected by means of this invention. Without taking into consideration horticultural exhibitions, which are likely to render the use of these beds very common, there is a crowd of circumstances under which very surprising effects may be almost instantly produced through their agency. This reminds one of those "Flower Islets," originated by the Prince de Ligne, the grandfather of the present President of the Belgian Senate. These were formed by tufts carrying a depth of earth sufficient for the purpose, and which were thus embellished with magnificent flowers. Every day a change was made, and some fresh floral combination sprang as it were from the water under the windows of the Château de Belœil.

The Sunflower as a Preventive of Fevers.—We continue to see favourable mention made of the virtues of Sunflowers as preventives of bilious fever, chills, fever, &c. A correspondent of the "Soil of the South," writing from a place in Alabama, which he says was peculiarly subject to fevers, gives the results of his experience on the premises, and in not a single instance where he planted Sunflowers around his negro cabins did their inmates suffer from fevers; while his wife, two children, and two house-servants all had fevers, he not having planted any of the Sunflowers around his own dwelling, which, in his opinion, accounted for the difference in the results. We trust that, next spring, New Orleans may be surrounded by a cordon of Sunflowers, that they may be scattered through every garden, and cover every vacant lot in the city.

* "Le Jardin Potager," par H. Spruyt, Professeur des Cultures Maraichères, Forcées et de Floriculture, à l'Ecole d'Horticulture d l'état à Vilvorde. 2nd Edition. - Braine le Comte. 1875.

THE INDOOR GARDEN.

FORCING THE GOLDEN-RAYED LILY.

(LILIUM AURATUM.)

WHEN it is considered that this Lily is one of the best of the genus for conservatory decoration, to get it to flower in perfection is worth a little trouble. The way by which I get it to produce strong flower-stems and plenty of fine blossoms is as follows:—I set apart a space in the propagating-bed, in size according to the number of bulbs I want to force. I then, with pieces of board, form a little square enclosure for each bulb; why I do this is to keep the roots of each separate, and to render them less likely to get broken when raised. For an ordinary-sized bulb I allow from 2½ to 3 square inches, which I fill up with damp Cocoa-nut fibre, in which I insert the bulbs. For these the bottom-heat should not be more than 55°, as a greater amount of heat must cause them to throw up weak stems. They should not be kept very wet, nor more than three-quarters of an inch below the surface. In about a fortnight or so they will have made plenty of roots, and will be beginning to throw up flower-stems, the bases of which, when about three-quarters of an inch in height, are bared a little, so as to let in air and light. When the stems have reached a foot in height, I lift the bulbs and pot them in three parts of good fibrous loam, and one part well rotted leaf mould and silver sand in a somewhat warm condition. The heat in the soil is obtained by burying in it some red-hot bricks, which warm it speedily, and that which gets burnt I place on the crocks as an impediment to the ingress of worms. The raising of the bulbs for potting is an operation which must be done with care. I place the left hand under the bulb, and with the right one gently raise the roots all around. I then pot them in 32-sized pots, after which I water them with tepid water and plunge them half the depth of the pots in the same house till they have become established. I then raise them on to the top of the bed, where they stand for two days, after which they are taken away and properly hardened off, when they will soon show flower. This mode of treatment I have pursued for three years with excellent results, and by it the bulbs come sooner into flower than they would do managed in any other way.

G. DAINS.

Rayner's Penn, Amersham, Bucks.

Tying Hyacinth Spikes Together.—Mr. James Cutbush, of Highgate, the well-known Hyacinth grower, protests against this practice in the "Gardeners' Magazine." To prevent any misunderstanding, let me say first of all that I am alluding to the practice of tying two or more spikes together to give them the appearance of one large solid spike. In my opinion, this practice must lower the tone that all exhibitors should have when showing a specimen of any plant for exhibition. If we are to do our best to try to deceive the public by forming one large spike with several small ones, and the theory that it is legitimate to do so is to become the order of the day, we shall have to retrograde instead of going forward, and get the old-fashioned varieties that are noted for splitting, and which have long been discarded by all genuine lovers of the Hyacinth. When a Hyacinth throws up more than one spike it is not a single bulb, but two or more confined within an outer sheath, and which is in reality the first stage towards a natural division. The bulb has, whether prematurely or not, become too old for the market, and the two or more portions contained within its outer covering have, of course, not attained sufficient strength to produce a perfect spike. It is "perfect spikes" we want on the exhibition table, to show those who attend the exhibitions what can be done by the selection of good bulbs in the first instance, and by skilful culture afterwards.

Sparmannia africana, an Ever-blooming Plant.—Having a fine specimen of this in great beauty, allow me to recommend the cultivation of this truly lovely plant to all who possess a cool greenhouse or conservatory; its great merit is that of being always in bloom. Ever since it opened its buds, on arriving from Sierra Leone, nearly three years ago, it has never ceased, winter or summer, to produce its rich masses of white flowers. The sepals of the calyx are fringed with delicate hairs, and with the petals falling back the filaments stand out very prominently, yellow at the base, and terminating in a fine crimson colour. The foliage is of a pale green hue, large, and heart-shaped; a profusion of hanging buds are always ready to supply the place of the fallen flowers. It is an arborescent shrub, belonging to the natural order Tiliaceæ, and was first noticed by Anders Sparmann, a Swedish botanist and traveller, in the year 1799. From its bearing a temperature as cool as 34° without suffering, I incline to think that it must have been introduced into the tropics from the Cape of Good Hope, which is probably its native habitat. My plant is 5 feet in height, though only in a pot. It

is readily increased by means of cuttings struck in bottom-heat, in loam and peat, under a hand-glass. No seeds of this plant have as yet come to maturity with me.—E. W. C., *Glen Andred*.

Araucaria Balansæ.—According to Mr. Balansa, the discoverer of this splendid tree, it attains a height from 130 to 160 feet. He found it growing at an altitude of about 1,500 feet, in the forests on the south-west table-land of Unio, Cape Bocage, and on the volcanic hills of Duperré Bay, New Caledonia. It has the habit of the well-known *Araucaria excelsa*, which, however, it appears to exceed in beauty, and the rich purple-brown of the upper side of the branches of the plants which we saw at Mr. Linden's, renders it peculiarly elegant. The leaves are imbricated all around the distichous, simple branchlets, which are pendulous at the tips. They are scaly, not exceeding a quarter of an inch in length, ascending, curved, triangular, slightly obtuse, somewhat tetragonous and four-furrowed. Messrs. Brogniart and Gris describe the male cones as $1\frac{1}{2}$ to 2 inches long. This fine species has at length been introduced in a living state, and is now in Mr. Linden's collection; it will probably be followed by other new and curious Conifers from the same region, so rich in vegetable wonders. The first plant imported was exhibited at Florence in 1874, under the provisional name of *A. neo-caledonica*. A closer examination has enabled us to identify it with *A. Balansæ*.—E. A., in "Illustration Horticole." [There is a striking plate of this plant in the last issue of this journal.]

Forcing the Flowers of *Magnolia conspicua*.—An accident gave me an opportunity of securing a large supply of the beautiful flowers of *Magnolia conspicua* during the months of January and February. A grand old tree here required (for reasons that need not be stated) to be considerably cut in; this was done after Christmas. I put all these loppings into a large tank under the stage of one of my houses, and very soon afterwards the buds began to swell, and ultimately they opened splendidly. The first hundred or so were remarkably fine, but the later flowers were not so good—an intimation of exhaustion on the part of the branches that produced them. Nevertheless, they were worth having to the very last, and the supply continued about five weeks, during which we cut a great number of flowers. In practising this system, the branches must be cut large to develop the flowers in water. Mine were flowered in heat from 60° to 65°.—R. OUBRIDGE, in "Gardeners' Magazine."

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Disrooting Camellias.—In reply to Mr. Baines (see p. 232), allow me to say that my object in disrooting my Camellias was to show what an amount of reducing the plants would endure. Having more than were required for planting out, many were pruned, and much closer than was previously stated, so close in fact, as to get them into pots 18 inches across. They have all done well, with good feeding.—H. GADD, *Wollaton, Notts*.

A Novel Mode of Preparing Soil for Potting.—We find the following under the heading of "House Plants" in a popular and excellent family magazine:—"Ladies who find their efforts to raise house plants frustrated by worms, may be able to win success by boiling the earth before setting the plants. Use little water, and allow it to simmer away after a few minutes of hard boil."

Camellia Jardin d'Hiver.—Having grown this both planted out and in a pot for some eighteen or twenty years, I find that, like many other Camellias, not excepting the double white, it has defects as well as merits. Being extremely pyramidal and compact in habit, the flower-stalk is too short for gathering; the flowers, also, when expanded, are a little deficient in the centre; therefore, as there are reds in abundance, I would not recommend it.—C. E. I.

Dendrobium heterocarpum.—This sweet-scented Orchid, reminding one of the odour of *Pergularia odoratissima*, or *Cymbidium aloifolium*, has greenish flowers, with a brownish-crimson lip; a combination of colour very novel and very beautiful. It is a free-growing Orchid, and, although pot culture is a convenient way of growing it, I prefer placing it on a block of wood, on which the flowers are shown off to advantage; and the "life-in-dry-bones" look which the plant possesses renders it an object of unusual interest.—CHEVALIER.

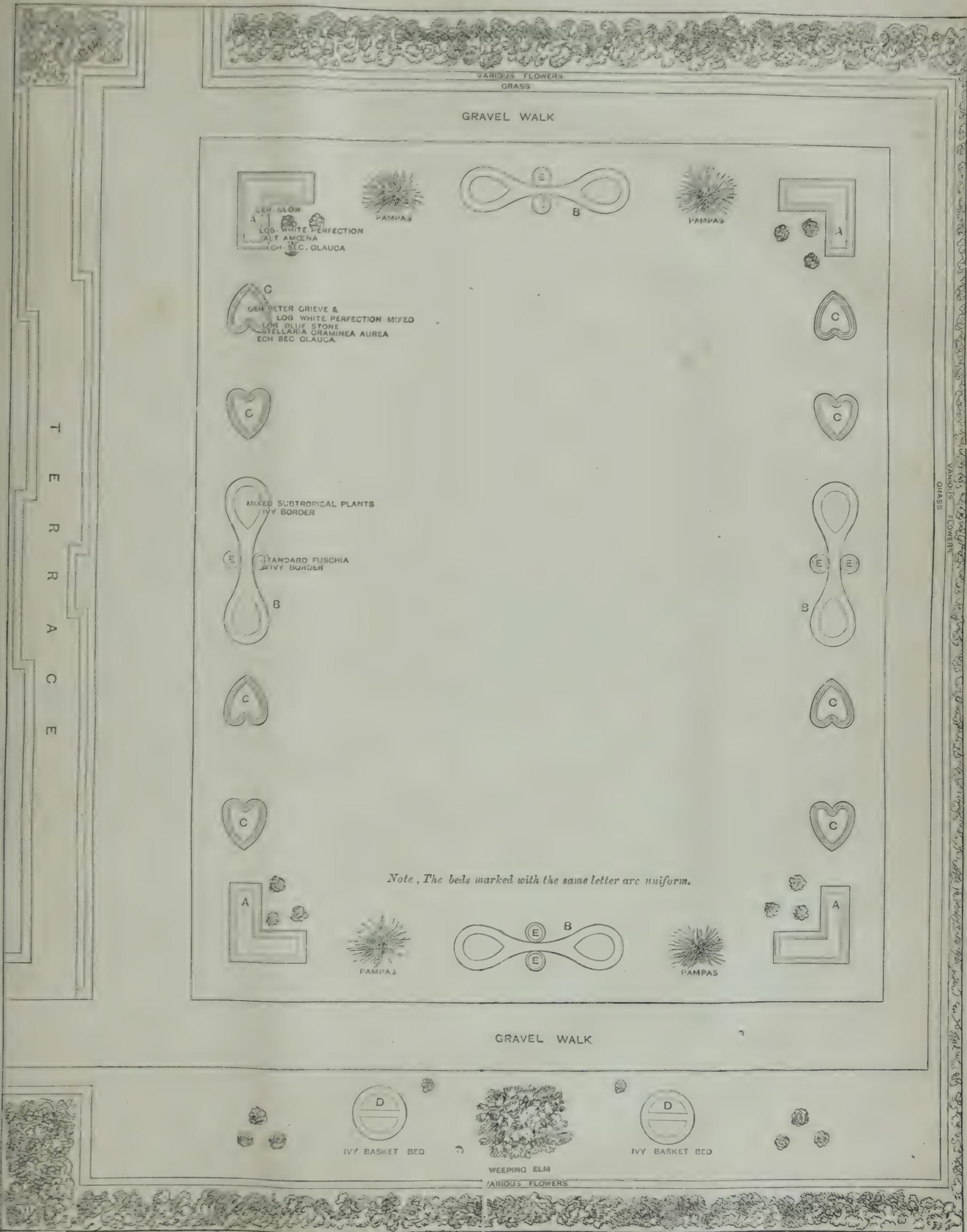
Wintering Bedding Geraniums.—The mode of wintering rooted cuttings of these (recorded at page 200), although differing from what I have seen done elsewhere, is not altogether new. Seven or eight years ago, when visiting the gardens at Cadland, I found that such cuttings were first struck in the open ground; then they were lifted, and around the roots of each a small handful of Moss was tied with a piece of bast. These were then stored thickly together in frames, or in boxes, in the houses; and, when put out in the spring, were laid in thickly on a shallow bed of ashes, and from thence moved with balls of roots to the beds. By this plan, the saving in pot-room and labour was more than can well be realised.—A. D.

Blue-flowered Hardy Plants under Glass.—Of these I have now in bloom, in pots, *Iris reticulata*, rich purplish-blue (previously mentioned by me); *Scilla sibirica* and *bifolia*, both rich shades of blue; Grape Hyacinth, bright Oxford blue; *Myosotis dissitiflora*, lovely cerulean or Cambridge blue; and, deepest and richest of all, *Lithospermum prostratum*. All these flower well in pots; but, perhaps, the *Lithospermum* is the most difficult to deal with. My plant of it, which has been in a pot for two years, now fills a 10-inch one. It thrives well in turfy loam mixed with a little leaf soil and silver sand. It has been in a cool-house all the winter, and well does it repay that care, being six weeks earlier in blooming than usual. As a hardy rock plant, it is, as regards colour and habit, unrivalled, and should be found in every good garden.—A. D.

THE PRINCESS TECK'S FLOWER GARDEN.

THE accompanying plan represents a square on the east front of the old Royal Palace in Kensington Gardens, surrounded by a belt of deciduous-flowering and evergreen shrubs, the rectangular piece of lawn in the centre being laid out as shown in our illustration. The beds around the margin are gay in summer with flowering plants, the bright colours of which are toned down by the cool green turf and surrounding belt of shrubs. The two circular basket-shaped beds on the south side, and some of those on the lawn, are surrounded with Ivy edgings, an arrangement by which a pleasing effect is produced, not only during summer, but also in spring, when these beds are full of Tulips, Hyacinths, and other early-flowering bulbs. Thousands of bedding plants are raised here for the decoration of Hyde Park, St. James's Park, the Green Park, and last, but not least, for the gay little semicircular parterre in front of the Ivy Cottage in Kensington Gardens. These consist of such things as *Kleinias*, *Pachyphytums*, *Lobelias*, *Alternantheras*, *Stellaria*, *Pyrethrum*, *Golden Feather*, and plants of a similar character; while such foliage plants as *Acacia lophantha*, one of the most graceful of all green feathery-leaved sub-tropical plants, *Musa Ensete*, and *Acanthus latifolius* are being raised from seed. In some of the larger houses are hundreds of large Musas, Arads, Cycads, Pandanus, and great fan-leaved plumose Palms, destined to ornament some of the most sheltered parts of Hyde Park during the coming season. In the frames outside are thousands of zonal and other bedding Pelargoniums, Echeverias, Sempervivums, Mesembryanthemums, and other succulents, nor do these monopolise all the resources of the establishment, for a fine stock of Peonies and other herbaceous plants is being got together for re-planting the long flower walk in Kensington Gardens. In one of the frames we noted half-a-dozen plants of the round-leaved *Saxifraga ciliata*, a kind well deserving of pot-culture, its waxy salmon-tinted flowers being freely produced at this season, and they last so well after being cut that it is surprising they are not more frequently employed in bouquets and other floral arrangements than they are. These plants, under the care of Mr. Cole, are judiciously and skilfully managed. Unsightly walls here and there have been trellised, and ornamented with creepers, and on the lawn, as will be seen, are many interesting specimen plants, but so placed as not to interfere with the open centre of green well kept turf.

The Nurseries of Ellwanger & Barry.—In a recent number of the "Daily Graphic," an illustrated American paper, there are published some illustrations of Messrs. Ellwanger and Barry's great nurseries at Rochester. America is largely indebted to these enterprising nurserymen for much that is valuable in horticulture. Recognising in the soil of the region of country bordering on Lake Ontario a singular adaptation to the culture of fruit, and comprehending the future demand for it in the year 1838, they commenced business, about one mile from the centre of the city, and not far from Mount Hope Cemetery. Such was their success that in 1850 they had 200 acres under cultivation, and in 1860 not less than 550 acres of the richest land in the Genesee Valley. Previous to the first-mentioned date, Mr. Ellwanger commenced as a florist in Fitzhugh Street, in that city. They were among the first to import fruit trees from Europe; and, in 1844, Mr. Ellwanger himself selected large quantities, principally of dwarf Pears, from the different nurseries throughout Europe, which he sent to America. To Ellwanger and Barry is due much of the credit of encouraging the culture of the Pear, as being peculiarly adapted to that country. From this date to 1860, various other nurseries were established in their vicinity, until Rochester bore supremacy in the nursery business over the whole country. Its nurseries produced more fruit and ornamental trees, shrubs, &c., than the combined nurseries of the United States. In the midst of competition Messrs. Ellwanger and Barry have pre-eminently retained their high position for integrity and intelligence. This firm keep 25 acres of land solely for testing new varieties. In the department of hardy ornamental trees, shrubs, Roses, and other plants, their collection is the most extensive and complete in the United States. Their specimens of the "big trees" of California, or *Sequoia gigantea*, are the best to be found this side of California. Mr. Barry is the author of "Barry's Fruit Garden," a standard text book. He was also for some years editor of the "Horticulturist," and has written for publication a great deal that is valuable. In 1839, they published their first descriptive catalogue, which they still continue to issue annually.



THE PRINCESS TECK'S FLOWER GARDEN AT KENSINGTON PALACE.

THE FRUIT GARDEN.

COOKING PEARS.

THESE may safely be classed with neglected fruits in many gardens; while in comparatively few are their merits fully recognised, their only representative too often being some broken-down specimen of the Iron Pear that has stood for an indefinite period in the most remote corner of the orchard. I find, however, that culinary Pears repay any little extra care bestowed on them; quite as much, or even better, than many dessert kinds. In the first place, they are extremely hardy and vigorous, Uvedale's St. Germain alone requiring the protection of a wall. The others succeed well, as espaliers, pyramids, or dwarf standards; but if allowed to grow very tall, especially in exposed situations, the fruit is liable to be damaged by wind; that is, if it escapes being blown off altogether. Culinary Pears are also regular and abundant croppers, and, unlike many of the dessert kinds, which, except in abnormal seasons, fail to ripen at the proper time, they are fit for use as soon as they are large enough, and continue in usable condition as long as there is any demand for them. They may be kept in any ordinary fruit room from October to May, without scarcely any loss from decay; and, with extra care they may even be preserved in a sound state until late in the summer. However, as soon as bush fruits become plentiful, the demand for culinary Pears ceases. It is when preserved fruits form the principal supply of the kitchen, that these Pears are most appreciated. Where they are disliked, it is generally the particular variety supplied that is at fault. I have frequently seen it stated that the better the sort of dessert Pear the better cooking Pear it makes. If this be the case, I have not yet met with the right kind. But, allowing that to be the case, we should still cultivate cooking varieties for culinary purposes; for, although last year Pears of all sorts were most abundant here, yet, last February, dessert kinds in season were too valuable to be spared in any quantity for kitchen purposes; while cooking varieties, properly so called, were as fresh as when gathered. The culinary sorts most esteemed here are Uvedale's St. Germain, Catillac, Verulam, Gilgil, and Morel. There are other kinds equally good, but, as such Pears are all excellent keepers, it is useless having too many varieties when a few that can be depended upon give satisfaction. They are as superior when cooked to the dessert kinds as the dessert kinds are to them for eating. It may be argued that some of our best dessert Apples are also good cooking Apples, but very few among sweet kinds equal the Wellington, that is, if that variety be considered only as a kitchen Apple. It is one thing to have the best variety of each fruit for each special purpose, but another to make shift with something that will answer that purpose, simply because nothing better is available. In many cases make shifts of this kind are so many bars to progress. This is a good time to graft any unfruitful or worthless varieties, by which means a bearing tree is quickly obtained and double grafting generally tends to extra fruitfulness.

JAMES GROOM.

Henham Gardens.

GRAPES IN UNHEATED STRUCTURES.

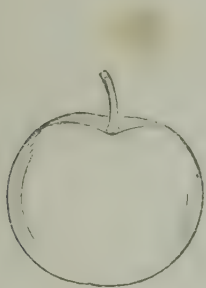
MR. TILLERY's last year's experience in this matter, at Welbeck, is thus recorded in the "Florist":—"A collection of hardy Grapes, on a glass-covered wall here, ripened during summer and autumn to the best crop I have ever grown under such conditions. Although such warm favourable summers as that of 1874 only come at intervals, still there are some kinds of hardy Grapes that, with a little attention in protecting them in the cold spring months, when budding or in flower, will produce ripe Grapes in our ordinary summers. The glass-covered wall here, where the hardy Grapes are planted, has only artificial heat applied to it when the Peaches and Nectarines are in flower, so that the Grapes have not the same advantage at their blooming time. I will commence with the white Grapes, as they were the earliest in ripening. The early white Malvasia, or early Kienzheim of the Royal Horticultural Society, ripened perfectly in the middle of August; this sort seems to me to be synonymous with the Grove-end Sweetwater. Royal Muscadine, or the Chasselas de Fontainebleau of the French, ripened in the end of August, and is one of the very best early white Grapes. Early Smyrna Frontignan is a Frontignan-flavoured Grape, and ripened as early as the Royal

Muscadine. Early Saumur Frontignan is another very early-ripening Frontignan-flavoured sort. The Prolific Sweetwater and Buckland Sweetwater ripened in the end of September, and got to a fine amber colour in October, and their flavour was excellent. Of early black Grapes, the Sarbelle Frontignan, a purple Frontignan-flavoured variety, ripened in the beginning of September, but it has only a small bunch. The Esperione or Espiran, the hardiest of the Black Hamburg section, ripened in the middle of September, and was finely coloured. The Welbeck Black Tripoli ripened in the middle of October, the bunches being as fine as some of the same variety grown in the vineries. To show that the summer of 1874 has been particularly favourable for ripening Grapes in unheated structures, I may state that two plants of the Muscat of Alexandria which were planted out in mistake with the hardy sorts both ripened their bunches; the Grapes were not very highly coloured, but perfectly Muscat-flavoured and good. A plant of Pearson's Ferdinand de Lesseps Vine likewise, lately planted out in the same collection, has borne some bunches this year, and promises to bear well as a hardy Grape. Some of the above varieties of hardy Grapes will ripen their fruit, even in bad seasons, in all our southern counties, if planted on a south aspect on walls or buildings. There cannot be a finer ornamental climber on a poor man's cottage than a Vine, whether in leaf or in fruit, but it requires attention in nailing or tying it to the walls, and in properly thinning and stopping the shoots every year. If allowed to grow wild, it gets battered about by the wind, and is then both unsightly and unproductive. There is no occasion for making expensive borders in which to grow hardy Grapes out of doors, for if the soil is anything at all of a fertile nature and drained, they will succeed well on it. In planting them in unheated structures, it would perhaps be better to give them a newly-made border, if the natural soil is not suitable or drained, with the view to the production of good-sized bunches and well-flavoured berries.

FRUIT VARIATIONS.

A GREAT deal of speculation is naturally indulged in by horticulturists when they see flowers or fruits growing out of the usual course of Nature. The changes from single to double flowers, the transformation of stamens and pistils to petals, and, again, the changes of some of these organs into green leaves, and new flowers bursting from the germ—these and many similar changes are too frequent, and take place too regularly to be fairly classed as monstrosities. There are, however, some other changes less frequent, and more out of the usual order of Nature, that may properly come under this head. Last summer we received from a correspondent specimens of Apples from the same tree, a part of the common round and regular form, and a part with a neck like a Pear, as shown in the accompanying illustrations. These Pear-shaped Apples were precisely similar to the round ones in colour, texture, and flavour; yet some insisted that they were produced by crossing with a Pear which grew not far off. We are not aware that crosses were ever produced between the Apple and the Pear, and we saw no indication whatever that these Apples were thus obtained. Since that time we have met with another curious deviation from the regular course of Nature, in a large number of Apples grown on a tree of the Fall Orange or Holden Pippin, a part of the surface of each specimen presenting the usual appearance of a smooth green or yellow skin, and another part covered with thick russet, with an abrupt margin between the two, the russeted parts being enlarged about a tenth of an inch. Some of the Apples thus affected had but a small portion of russet; others were nearly covered with it. Some had one-half russet—sometimes in a nearly straight line, and on others a broad belt extended around the fruit. In short, it appeared to be applied in various ways, though never in spots or small patches, but in broad portions and always extending around the fruit. Wishing to know how the appearance of these curious specimens would strike others, we sent some to a few distinguished horticulturists. One of them wrote:—"At one time we did not consider it possible for a mixture of the pollen to affect the fruit farther than the seeds; but, in the light of more recent experience, we think it possible for the flesh and pulp of the fruit to be affected as well as the seed, or such a 'sport' may have come from the stock as a graft hybrid. We can at best but speculate on a case of this kind. Mr. ———, who seems to interpret all these anomalies literally, would say it was a clear cross between a Russet and a green-skinned Apple." Mr. Fuller, in the "Rural New Yorker," says, in a general way:—"The Russets may have originated from the Pippins, or *vice versa*, and an occasional reversion to the original parent in some specimens would be no more wonderful than similar freaks met with among other plants. We have what are called 'sports' in nearly every genus of cultivated plants—white Roses that have originated from a 'sporting' branch of a red Rose, and the reverse of this; and, although the peculiari-

ties of these bud variations may remain permanent in the main, still a reversion to types does occur more or less frequently. If we take this view of the case, which to us seems to be both rational and natural, the presence of a Pearmain on the same twig with a Russet, or even a mixture of the two in the same specimen, like the one sent us, is by no means to be considered a surprising freak of Nature. We are well aware that many will take an entirely different view of this subject, and attribute the cause to the effect of fertilisation of the flowers. If a Russet Apple is found growing on a Pearmain tree, it would be at once claimed that the former supplied the pollen which fertilised the stigma of the individual flower producing the specimen so varying from the normal type. But horticulturists have made altogether too few experiments in this field to give us sufficient materials for determining the influence of the pollen of one plant over the envelope which encloses the seeds of another." As for the immediate causes of the abnormal developments to which we have referred, we have long been of the opinion that they are not caused by union in budding or grafting, or by cross-fertilisation,



Ordinary-shaped Apple.



Pear-shaped Apple.

but by various external influences. The Sweet-and-sour Apple is obviously caused by a diseased or imperfect development of a portion of the fruit, similar to the diseased or defective growth in Ribbon Grass; and many of the monstrosities mentioned are known to be caused by cultivation or stimulated growth. The Pear-shaped Apple, which we have figured, has doubtless been produced by some unknown external influence. The immediate cause of the large russet coverings and belts in the Fall Orange Apple was evidently produced by a fire, which slightly cooked the Apples, when small. A large brush heap, 20 feet distant from the Apple tree, was burned during our absence, and the heat was sufficient to give a brown surface to the most exposed sides of the young fruits when about 1 inch in diameter, without destroying them, and only slightly crisping the foliage. These browned Apples were the only ones affected with russet, but not on the exposed sides, for the russet



Apples with semi-Coverings and Belts of Russet.

covering extended around them equally on both sides. In what way the heat caused the development of russet, we leave physiologists to tell us; a repetition of the experiment on different fruits, by different kinds of heat, may possibly yield some curious results. The past season was the only time in which this russet was ever developed on them.—"Cultivator."

Two Good, but little known, Strawberries.—There has lately been a good deal of discussion respecting Keen's Seedling, which, in times gone by, and previous to the introduction of the many improved kinds now in cultivation was certainly not devoid of merit; but now a-days, when we have such handsome, large, and exquisite kinds as President, Sir Joseph Paxton, Early Prolific, and Duke of Edinburgh, all of which are good bearers, Keen's Seedling has been, to some extent, superseded. To those, however, who still prefer it to other kinds, I would say try Dumbarton Castle, which is apparently a seedling from it; both in foliage and earliness it resembles it, but its fruit is so irregular in size; it is also an enormous bearer, and may be depended upon under all circumstances. I am unacquainted with its origin, but believe it was raised in Scotland, and sent out by Messrs. Lawson. Whilst I have wholly discarded Keen's Seedling from my attention, I am so well pleased with Dumbarton Castle that I shall largely increase it both for out-door culture and for forcing. Another valuable Strawberry is Waltham

Seedling, for which we are indebted to Mr. Wm. Paul. This was only sent out a few years ago, and owing, no doubt, to that circumstance, is as yet but little known. It is, however, a great acquisition, being both hardy and vigorous, and its fruit, which is handsome, is excellent in flavour, and travels well. I have this year put a number of it in my Strawberry-house, and am pleased to say that it likewise bids fair to be one of the best kinds which we possess for early forcing.—FERDINAND GLOEDE, *Effendorf, Hamburg.*

Many Varieties of Pears on one Tree.—Some years ago, happening to call at a rectory in Lancashire, where much attention was paid to gardening, I saw what I consider a most excellent plan for growing a large collection of Pears, of which at least one hundred varieties were produced in a limited space. The outside boundary-wall of the garden was perhaps 12 feet high, which was, on the south side, devoted to these trees, and upon it there may have been from ten to twenty of them, perfectly trained upon the horizontal system. Originally, there may not have been more than one tree, or perhaps two, of any particular kind, which gave, as is often the case, a glut of fruit, one-half of which was certain to decay before it could be consumed. Each of these trees, however, are now made to bear from ten to twenty varieties, by grafting. Some half-dozen of the branches were sawn off, about 6 inches from the bole, and grafted with scions from choice Pear trees, of both early and late kinds. Assuming that there were twelve trees, and upon each were ten grafts, 120 varieties would thus be produced, and this number would, I imagine, be enough to satisfy any grower, however capable his grounds might be for extensive operations of this kind. It is scarcely necessary for me to point out the advantages of the system I have here referred to. Its utility for testing varieties, as regards adaptability to soil, situation, &c., will be recognised at once, but I may mention that Pears from this particular wall were frequently exhibited at the Horticultural Societies' shows, and commented on favourably by the late Donald Beaton.—THOS. WILLIAMS, *Ormskirck.*

Curious Affection of the Vine.—I carefully perused the article in your columns headed "Vine and Peach Tree Destroyers" (see p. 189) in order to see if the *Otiorynchus* mentioned was a grub which came under my notice last summer; but I find that my enemy is evidently of a different kind. Last year, about this time, when the Vines in our second Vinery were starting into growth, I noticed some warts about the size of a Broad Bean on several of the rods; but as the Vines were in active growth, I left them alone. The result was that, by November, several of these warts had attained the size of a goose's egg, but a great many of them seemed to dry up. When pruning the Vines last December, I pared the large warts completely off, and in all of them I found little fat maggots embedded close to the stem. Eight was the most which I found in one wart, and two the least number. They were perfectly white, with yellow heads. I treated them as I do all weevils and grubs, viz., killed them. The Vines did not seem to suffer in the least last year from the warts, nor do they bleed now from the hard-paring to which they were subjected. I should esteem it a favour if you would tell me what the maggots are, and if I may expect them to appear again this year.—DOUGLAS BROWN, *The Gardens, Mocollop Castle, Ireland.* [Mr. Brown's communication is very interesting, for nothing like the galls he describes seem to have hitherto been published. Audouin, in his large work on the insects hurtful to the Vine, takes no note of them; and Kaltenbach, in his recent *Pflanzen-feinde*, alludes to nothing that can be supposed to be them. We are all familiar with excrescences on the Vine, but these are caused by hypertrophy. We are, therefore, so selfish as sincerely to hope that Mr. Brown may have a fresh crop of warts this spring; and we trust that if he does, he will not fail to send us specimens both of wart and insect. It may possibly be some insect not natural to the Vine, such as *Ceutorhynchus assimilis*, which makes galls on the Cabbage-stalk, which has changed its habits and abjured its nature.—A. M.]

Storing Fruit.—The result of the various experiments of members of the Pennsylvania Fruit-growers' Society in keeping winter fruits may be summed up as follows:—Take the fruit from the trees as soon as matured, pack in wooden cases, and store in a temperature as low as possible, so that it shall not freeze. The great point is to have the fruit fully matured when picked from the tree; and it was stated by one or two that the atmosphere must be entirely dry, and yet the most successful fruit grower in the southern part of the state decidedly advises moisture in the air. He prefers a "spring-house," or one near running water. All apartments in which fruit is stored should be in every case thoroughly ventilated. Mr. Brinton eulogised the practice of packing the fruit in barrels in the orchard, and leaving it there until severe weather. Mr. Stetzel spoke of a complete fruit-house in Reading, where the fruit is packed in boxes and placed in an apartment in an ice-house, so that the temperature is preserved even and very cool. Fruit is kept in this way from one season to another. This arrangement is a

modification of the Nice system, and more simple and cheap. Mr. Engel said that failures often result from fruit being taken from sickly trees.

Pruning Peaches and Nectarines.—In pruning Peaches and Nectarines, what length of shoot, and how many fruit buds on a shoot, should, as a general rule, be left?—M. W. [In pruning Peaches and Nectarines in winter the first rule to be laid down for a basis for all the rest, is to shorten every shoot in proportion to its strength, and to prune to where the wood is firm and well ripened: this will cause all the pithy and unripened wood to be removed, thence causing a supply of that which is better ripened for the ensuing year. But in order to give every facility to the ripening of this wood, it must be trained thin; not in profusion according to the general custom, but such shoots only as may be required for the following year. Trees which have arrived at a bearing state should have their strongest bearing shoots shortened to 12 or 14 inches, those next in strength to 8 or 10, and the weaker ones to 4 or 6 inches, pruning each to what is termed a treble eye, or that where there is a blossom bud on each side of the wood bud: where branches are not in a bearing state, these treble eyes will not be found; they must therefore be pruned to a wood bud alone, which is always known by its sharp point].

New Pears.—Antoine Delfosse and Beurré Gambier are the names of two New Pears mentioned by M. Charles Baltet in the last number of the "Bulletin d'Arboriculture." The first was raised in 1863 by M. Grégoire, of Jodoigne. The tree is of moderate vigour and very fertile; the fruit rather large, of a truncated pyriform shape. The colour is a dark greenish-yellow, with tawny spots. The flesh is melting and juicy, and of most exquisite flavour. It ripens during the second fortnight of November. The Beurré Gambier was raised by M. Gambier at Rhode St. Genèse. The tree is moderately vigorous upon the Pear stock, but weak upon the Quince. The fruit is large, and resembles in shape the Beurré d'Hardenpont and Doyenné d'Hiver. The skin is smooth, and in colour green suffused with rose upon a yellow ground. The flesh is melting and agreeable. The fruit ripens from the end of December to the end of January; and, hanging long upon the tree, should be gathered late.

The Howell Pear.—This is a New England Pear, and is now well known and appreciated. Its merits, however, are perhaps more generally understood in Southern Illinois than anywhere else, as hundreds of trees of this variety are bearing fruit there, and paying their owners as handsome a profit on the investment as any other variety in that State. It does exceedingly well at the East, too, embracing that great essential to popularity—early bearing, one of the merits belonging to the Bartlett. A tree of the Howell in full bearing (says Mr. Hoopes, in the "New York Tribune") is a sight worth going some distance to look upon. The large fruit, distributed evenly over the tree, with a beautiful yellow ground, heightened by a rich, ruddy-red cheek, leave nothing to be desired excepting a luscious, melting, juicy flesh, and all this it claims as well. It reminds one more of the old White Doyenné in its ancient dress than any variety of modern introduction. It has been said that it is addicted to the blight, but the weight of testimony is rather the other way.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

A Roundabout Way of Testing Fruit.—In the "Revue de l'Horticulture Belge," M. Banchet describes a test for ascertaining the quality of a Pear. It, says he, you can write on it easily with pen and ink, it is a good Pear. Other Pears, whose rind does not take the ink so well, are inferior in flavour.

The Best Plunging Material.—The best plunging material with which I am acquainted is sawdust from green wood. We have here two Pine pits heated with dung linings, but since using sawdust the linings are dispensed with.—R. GILBERT.

Beurre d'Esperen the Best Late Pear.—This is the best late Pear; here it does well on pyramids and, unlike Glou Morceau and Beurré Rance, which are liable to crack, the Beurré d'Esperen is smooth and really good from January to March. It is also a free and excellent cropper. Ne Plus Meuris in some localities is fine in flavour, but here on a west wall it is simply useless, except for baking purposes. I am trying the finer varieties of French Pears on single stems planted 5 feet apart against a south wall. I also intend trying some of them with three stems. Four years ago I planted two dozen to be trained over arch-ways, and they have fully answered my expectations.—R. GILBERT, *Burghley*.

Glass Copings and Frost.—Those who depend upon glass copings keeping out 10° or 15° of frost (see p. 213) will be sadly deceived. During the late frost, our late Peach-houses fell to 30° when there was 20° of frost outside, though the heat was not turned off till 10 p.m. When not fired at all, they fell to 31° in the morning with 7° of frost outside. When more than this, and less than 15° of frost, the soil of the borders got frozen, and bedding Geraniums had to be covered with mats. An iron conservatory here falls to 32° without fire-heat when there are 5° of frost, and I have seen Peach-buds frozen and Strawberry plants quite hard in a Peach-case, shut up early without heat, with 15° of frost out of doors. Dry frigi domo will keep out more frost than a glass case, if sheeted from the coping to the ground; when wet and frozen, it is not much, if at all, inferior to glass as a protector. Straw mats are the most effectual protectors of all.—J. S. W.

THE NEAPOLITAN CROCUS.

(CROCUS IMPERATI.)

THIS lovely species, without a rival in its own genus, and holding its own as a gem of gems among all spring flowers, appears to have been first introduced into this country by the Hon. Mr. Fox-Strangways, afterwards Lord Ilchester, who states that "it grows in profusion all about Castellamare, La Cava, and Salerno, and other parts to the south of Naples, in every hedge-bank to the height of 2,000 feet, or more, above the sea. It is wonderful that so fine a plant has not attracted more notice than it has done in such a frequented country." Well might he make this remark, for anything more strikingly beautiful than the combination of colour afforded by the delicate fawn of its purple-striped outer petals, and the soft mauve of their inner side, it would be difficult to conceive. The exquisite little *Crocus minimus* of Corsica, and the lovely *Crocus biflorus striatus* which studs the Grass plots of the Boboli Gardens, at Florence, are very beautiful, but they cannot compete with *C. Imperati*. This pretty species seems to have been well known to that first and foremost of *Crocus* growers, Dean Herbert; but, since his time, it seems strangely enough to have been totally neglected, and almost, if not quite, lost to cultivation till the last few years, when the floral world



Stigmas, Anther, Corms, and Section of the Leaf of *Crocus Imperati*.

has been awakened to its merits, mainly through the instrumentality of Major Trevor-Clarke, of Welton Place, near Daventry, who has, with great liberality, distributed it among his numerous friends. It may be said to form a link between the autumnal and Vernal Crocuses, for sometime before Christmas its leaves come well above ground, and by Christmas Day (often much earlier) its fawn and purple buds may be seen pushing up unchecked by frost, wind, or snow, and opening their exquisite mauve lips to catch every passing gleam of sunshine, when scarce an Aconite or a Snowdrop has thought of putting in an appearance. It is so hardy that nothing seems to hurt it. It lasts in bloom from Christmas to the middle of March. It increases rapidly under ground, and produces seeds plentifully. There is a white variety of it, which grows on the higher parts of the mountains near Naples, and which appears never to have been introduced to cultivation, a defect the sooner remedied the better. *C. Imperati* belongs to the *Odontostigma* group. *C. suaveolens* of Bertoloni, a native of the Valle d'Inferno, near Rome, which does not appear to be now in cultivation, closely resembles it, but it belongs to the *Holostigma* group; it has narrower petals, and the leaves appear at the same time as, and not before, the flowers. *C. Imperati* bloomed this year at Tooting with Mr. Barr and Mr. Parker, and from both these growers blooms of it have been received.

H. HARPUR CREWE.
Drayton-Beauchamp Rectory, Tring.



733 NEAPOLITAN CROCUS.
(*C. Imperati*.)

THE KITCHEN GARDEN.

THE NEW RACE OF POTATOES AND THEIR CULTURE.

THIS valuable and well-known esculent, now so widely cultivated, is a native of the mountainous parts of tropical America, and was taken to Spain and Italy by early adventurers in the sixteenth century; for we read of its cultivation in those countries in the year 1550. The usual size of the Potato in its wild state is rarely more than an inch in diameter, and the flavour very insipid and almost unpalatable. When first introduced into Europe it created some excitement, of a similar character to that caused by the introduction of Tobacco and Coffee; for many years it was only to be found on the tables of the opulent, where it was used as a dessert either in the form of a sweetmeat or as a fruit. The first varieties grown in the United States were taken there from Europe. The quality was very poor, and not a variety then in use would at the present time be deemed fit for the table. It is only within a comparatively recent period that it has found its way into both Continents as a general article of food for man and beast, or has received attention from cultivators. Many of our most practical and foremost gardeners are now directing their attention and energies to its improvement and propagation. In the year 1845, the disease known as the rot appeared, and nearly destroyed the whole crop. About this time a few persons, among others the late Mr. Goodrich, of Utica, imported a lot of the wild varieties directly from South America, and proceeded to raise seedlings by crossing with the various kinds then in use. Many thousand seedlings were then produced, but few of them were ever brought to any state of perfection. One of the principal sorts saved was the Garnet Chili, which had a great reputation, and is the parent of many of our new sorts which are now attracting so much attention. Some fifty years ago, a cultivator who raised one hundred bushels of Potatoes was looked upon as having an enormous stock; while to-day, many growers in the vicinities of our large cities raise from ten to twenty thousand bushels, without exciting any unusual attention. Within this period nearly all the numerous varieties with which we are acquainted have been brought to notice, and every year adds its score of new seedlings to the already overgrown lists. Enormous quantities of Potatoes are now raised annually in this country, and the demand is always greater than the supply.

The following information, issued in their Potato catalogue, by Messrs. Bliss & Sons, who sent out so many of the kinds that have recently been proved so valuable cannot fail to interest Potato growers:—The uses of this tuber are numerous, apart from their principal use as an article of food. Thousands of bushels are annually manufactured into starch, and alcohol is distilled from its juices. Even sugar has been made; but with so much competition in this line, it has never proved a great success. Too much cannot be said in favour of this valuable staple, and we shall endeavour to instruct our readers in these columns as to the methods used to increase the supply, without increasing the expense of its cultivation.

Cultivation.

The soil acknowledged to be the best for the Potato is a rich loam, sandy, and neither too wet or too dry. A cool, moist soil will produce larger Potatoes, but the danger of too much wet is so great that a warmer soil is preferable in this climate. Early Potatoes reach their maturity sooner in a quick, light soil, and present a brighter and cleaner appearance, than when dug from that which is heavier. A calcareous formation generally yields a sure crop. Old sod land, well turned under in the fall, and lightly ploughed and harrowed in the spring, will produce a sound crop, and often an astonishingly large one. Clover sod for this purpose is excellent, and furnishes a large amount of vegetable substance to the ground. When turned under in August or September it will rot by the following spring, and only a top-dressing of some well-established fertiliser will be required to carry through the crop. Wet land produces a coarse, unpalatable article, and one of little value even as food for cattle. Barn-yard manures are of little benefit to such land. Lands should never

be ploughed while wet and heavy; it injures the soil and does more harm than the manure can offset. Prepare the ground as carefully and thoroughly for Potatoes as for any other crop. Attention in this particular well repays the cultivator. Land intended for Potatoes requires but little manure, and that should be old and well rotted. By many, spreading the manure before ploughing in the spring is thought to be the best mode. At the time of planting, bone-dust, ashes, plaster, marl, and like fertilisers can be used to great advantage with this crop, as they are of a dry or absorbent nature. On wet soils they are very beneficial, as they prevent disease as well as promote the growth of the tubers. On warm, dry, light land, muck compost may advantageously be used; decayed leaves are excellent. In seasons of disease among Potatoes, fields where ashes have been used have suffered but little from the rot. Potatoes are usually planted in drills or hills, the latter being the more common method in this country. Some varieties require more space than others. For drills, $2\frac{1}{2}$ feet by 3 feet is ample; while, when planted in hills, 3 to $3\frac{1}{2}$ feet is the usual distance. The latter method has some advantages, as the cultivator or horse-hoe can be used both ways of the field. Some of the earlier varieties may be planted closer without loss to the crop. Cover about 4 inches in light soil, and not so deep in the heavier. Cultivation should be commenced soon after the shoots appear above the ground, and weeds should be kept down with as much care as in a Carrot-bed. The earth should be drawn a little towards the hill at each hoeing, that the rootlets may gain strength and nutriment from the surrounding earth. When the blossoms appear, hoeing should be discontinued, and in fact is rarely necessary, as the stalks then cover the ground and discourage the growth of weeds. An excellent plan is to go over the field occasionally and remove carefully any weeds that appear in the hill, for they draw largely from the sustenance required for the developing tubers. Many farmers still continue to plant three to five eyes to the hill. In our opinion this is a mistake, and the last few years' experience confirms our views. Potatoes cut carefully to a single eye, the hills, perhaps, a trifle closer, will yield a larger crop than the careless way of throwing in seed by wholesale. We all know the effects of too close a growth of Carrots, Turnips, and such roots on the crop, and we think the same rule applies equally to Potatoes. Two good eyes to the hill, with a proper proportion of the flesh to each eye, will produce a far larger crop of merchantable tubers than two whole ones; will yield from one-third to one-half more in weight—an item of no small consequence—to say nothing of the saving of nearly one-half the seed. Any good cultivator, who is up to the times and reads the leading horticultural papers, will corroborate this statement. In order to secure an early crop, the seed must be planted as soon as the ground is in proper working order. This time differs in the various parts of our extended country, so that no set time can well be given. The earlier varieties can be marketed in sixty-five to seventy days from planting, thus competing successfully with southern crops of the more common kinds. A second crop can thus be planted, as described elsewhere, allowed to thoroughly mature, and thus have a good seed for another year, and a sound article of food for winter use. The yield of the first planting will give a handsome profit, for early Potatoes always command a high price when near a city or town. The later varieties do better when planted some weeks after the early kinds; and the cultivator has this advantage, he can get the former well started and cultivated before he turns his labour and attention to the latter. A common method of forcing Potatoes is to select whole, sound tubers of some early variety of medium size, placing them close together in a moderately heated bed, composed of either light loam or partially decayed leaves. This should be done several weeks—say three or four—before the time of planting. By that time the tubers will have started sufficiently to be set out. Cut the Potatoes into pieces as has been directed, and use care not to injure the young shoots. Plant 3 inches deep, apply a little horse-manure to the bottom of the hill, to afford warmth and to urge forward and nourish the young starting tubers. The decay of the tops indicate the maturity of the roots. The latter kinds often continue to grow till checked by autumn frosts. They should, however be dug before the ground is touched by frost at night.

Cutting the Sets.

This is one of the most important subjects to be considered in the propagation of Potatoes, and there is such a diversity of opinion regarding the manner and method of cutting, that many pages could be filled in giving the different experiences of the professors in this art. While we do not attempt to decide this question to the satisfaction of every one, we shall give our own views, and claim that in our method an enormous quantity of the tubers now annually planted may be thrown into the market, causing a reduction in the prices charged for this common and necessary crop. Without discussing the respective merits of planting whole Potatoes, or half-a-dozen pieces, each piece containing three or four eyes, in a hill, we shall state, what has been proven by so many cultivators, that two good eyes are ample for one hill, and the yield of large marketable Potatoes is larger than when more are planted. With the aid of the cut we trust our readers may be enabled to understand our method. Take any Potato and hold it before you, with the stem end (the place where it was joined to the stalk) down. It will then be noticed that the eyes are arranged around the tuber in regular ascending rotation from the bottom to the top, similar to the thread of a corkscrew, each eye being a little above and further round the side than the one next below it. Now take the Potato in the left hand, with the stem end down, keeping it in a perpendicular position throughout the entire cutting. Take a sharp, thin-bladed knife and remove the first eye, by placing the knife about equally distant between it and the eye next in rotation above it, sloping it to the indenture left by the stem (see dotted lines in centre cut), removing the flesh with it. When the first eye is removed, turn the Potato around in the hand until the next eye above appears. Remove this one in the same manner, and keep on turning the Potato, removing each eye as it appears in exact rotation, always sloping the knife to the stem. After three or four eyes are thus removed, the bottom part of the tuber will have a somewhat pyramidal form (see centre cut). It will be noticed that each eye removed has a similar form to that represented by the cut on the left, and has its proportionate share of the flesh attached. After the first two eyes are removed no further trouble will be found until the seed end is reached, and only a little extra care will be required to remove these closely clustered eyes. The cut on the right represents what remains of the Potato after all but the small eyes are removed, while the dotted lines show how to separate each of these. It will be noticed that the base retains the same form throughout, and by sloping the knife each time, and cutting down to the apex of this inverted pyramid (which is the centre of the tuber), each eye will be supported by an equal amount of the flesh which is to start it into a strong, healthy growth. With common varieties, where seed is cheap, many will think this manner of cutting too troublesome. But if every cultivator should save one-half his seed, as he easily could do (for it will only require two barrels of sets for an acre, instead of four, as is usually planted, the increase being equal), thousands of bushels would annually be saved. But to those who wish to obtain a large increase from a small quantity of seed, as is necessary to those who buy the new and valuable varieties, this manner of cutting so that every eye is saved will prove invaluable.

How to Raise Potatoes from Cuttings.

For this purpose any ordinary hotbed may be used. About the 1st of March take the Potatoes to be propagated, dividing them lengthwise, and laying these pieces with the cut side down upon the soil of the hotbed. Keep them perfectly dry until the top part has healed over and the sprouts have commenced to start. When the sprouts reach the height of 3 or 4 inches, cut them off about half-an-inch above the eye, and insert the ends of the cuttings thus obtained into the soil of the hotbed. Shade them from the sun, and water carefully until they are well rooted and the leaves begin to develop. The old pieces of the Potato will continue to throw up shoots to an almost incredible number, and these are all to be removed, as soon as strong enough, in the same manner as the first ones. In order to increase the crop still more, as soon as these cuttings have reached the height of 8 inches, their tops may also be removed, and planted in the same manner as

the slips from the Potato. As soon as the ground becomes warm and can be worked, prepare it as is usual in planting the tubers, and set out these young plants. It is best to transplant them on some cloudy day or towards evening, as the hot sun withers them and destroys many if planted in the hot part of the day. These plants will be found to grow very rapidly, and can be propagated indefinitely from cuttings of the older plants. No cuttings should be taken after the first of August, as they are liable to be destroyed by the cold weather before the crop is matured. The immense increase of stock by the use of this method may be illustrated as follows: a pound usually contains four medium-sized Potatoes, and there are from twelve to twenty eyes on each tuber. When cut and sprouted they will give, at least, five hundred plants. From each of these plants three cuttings may be taken, which gives a total of two thousand plants to be set in the ground. With the ordinary yield, each hill, at the lowest estimate, would give one-and-a-half pounds, or three thousand pounds; in all making about eighteen barrels of good, sound Potatoes, or a year's supply for a large family. We do not claim that this is either profitable or advisable with the common sorts of Potatoes; but with the many new and high-priced varieties which are now being disseminated at the prices of one, two, or three dollars a pound, it is almost invaluable, as for a slight expenditure a large stock may be obtained, paying to the propagator a thousand-fold. This is no new experiment, but has been practised by the initiated for the last few years, and has ever



Economical mode of cutting Potato sets.

proved a success. It is not confined to hotbeds, but many of our most prominent nurserymen have devoted whole greenhouses to this use, and we would confidently recommend it to our readers.

Two Crops a Year.

Take good sound early Potatoes, and cut them into single eyes, as is shown in the article on cutting. Allow these pieces to dry for a day or two, and then plant as early as the ground can be worked (a slight frost will not injure the Potato after being well planted). With ordinarily favourable weather the new crop of tubers will mature in from eight to ten weeks. As soon as they are ripe, dig them, and, after remaining a day or two in some dry and warm place, proceed to cut them into single eyes, as before. Place the pieces thus obtained into pans or boxes containing dry plaster or gypsum. This absorbs the abundant moisture, which would otherwise greatly check the growth, if it did not destroy the sets entirely. Allow them to remain in the plaster for ten or twelve days, or until the eyes commence to start, when they are to be taken out and planted as before. In the latitude of New York this is only applicable to new varieties, like the famous Early Rose or Extra Early Vermont, which are of a quick growth and early maturity; but, in many parts of the South, where the growing season is

long, it may be practised indiscriminately upon all varieties. A gentleman has raised two crops of Early Rose, a short time since in this vicinity, the two crops yielding an aggregate weight of 2,500 lbs. He planted his pound, cut into single eyes, early in March, and dug his first crop about the middle of May. These were then treated as above described, and planted on the 10th of June, and the second crop dug the 1st of September. The yield from the one pound at the first digging was 50 lbs.; and the second crop of this increase was 2,500 lbs., or over forty bushels. This method is within the reach of all, and there is no extra expense incurred for hotbed sashes, or any other forcing requisites.

How to Raise Seedlings.

Save any well-ripened seed-balls from a good variety, and plant in early spring in well-drained boxes of sandy loam. Sow the seed on the surface, and sift fine soil over them to the depth of one-quarter to one-half an inch; water sparingly, and, when the seedlings are 3 inches high, remove them from the seed-box without disturbing the earth around them more than is necessary, and plant in more roomy quarters. Many successful growers, however, prefer sowing the seed in open ground, when a partially shaded spot may be selected, and the seeds may be sown in drills about 10 inches apart; cover with half-an-inch of soil. When the plants are strong enough, thin out or transplant, and keep down the weeds until the tubers ripen. Some few strong-growing varieties will form tubers weighing from 6 to 8 oz. the first year. As a general rule they will be about the size of a Walnut. Store the tubers carefully until the next season, keeping them as cool as may be without freezing, when they may be planted in the same manner as any mature Potato. It usually takes three years to ascertain the true value of a seedling, and if a person is favoured by finding one really good variety among the many seedlings, he may feel well repaid for his time and trouble. Many new varieties are raised by hybridisation, which is a more difficult method, although it generally secures a greater number of good varieties. The manner of procedure is as follows:—Remove all flowers excepting those you wish to hybridise, then with a pair of sharp scissors remove all the anthers from the stamens in the flowers to be impregnated, just before they commence to discharge their pollen. When the flowers are dry, shake the flower containing the stamens of the variety which you wish to cross with it, being careful to do it when they are ready to discharge their pollen. Fit a piece of fine netting over the impregnated flower, to prevent the bee and other insects from leaving the pollen of other varieties upon the exposed pistil. The covering may be removed after two or three days. Do not disturb them again until the seed-ball has become well ripened, when the treatment as given in the first part of this article may be applied. Instances have been known, though rare, where one Potato would produce two distinct sorts from its different buds or eyes. The white Peachblow, for example, has been found growing on the same stalk with the Jersey Peachblow. As so much interest is now excited in the growth and propagation of new seedlings, and many of the new varieties command such high prices—it behoves our cultivators and amateur gardeners to avail themselves of the latest and, by actual tests, the best method of producing new varieties.

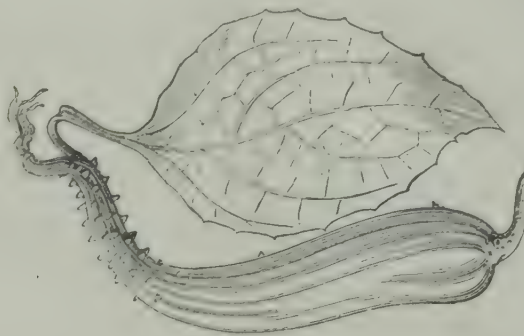
How to Store and Keep.

It is a matter of no small importance to the cultivator to be able to keep his crop of Potatoes in good condition through our long winters, and to present them for sale, free from blemish or mildew, in the spring. A well kept Potato brings three or four times its value in the market in early spring than the same stock will, if sold in the fall, paying an extra profit over and above the cost of storing, handling and care required. Of the three methods of storing in general use each has its champions. They are—storing in barrels, bins, or heaps or pits. The advantage of placing in barrels is, they can be easily handled, do not suffer from abrasion, can be readily looked over, and if disease presents itself it can be checked or removed. When thousands of bushels are raised on one farm, this method cannot be followed on account of the time and expense involved. Bins are largely used by our fore-handed

cultivators, especially those near large cities, as the tubers can at any time be reached and got ready for market. A dry, cool, well-ventilated cellar, with the light excluded, is the best place to store Potatoes. It has been found very advantageous in preventing decay to sprinkle lime in the barrels or bin at the rate, say, of one pound to each barrel. It acts as an absorbent and neutralises the earthy odours, thus directly acting as a preventive of decay to the tubers. The importance of excluding light from Potatoes, and keeping them as cool as possible, cannot be overestimated as means of preserving the crop.

A CUCUMBER MONSTROSITY.

I HAVE sent you a small fruit of Rollisson's Telegraph Cucumber, which has produced an entire leaf almost at its extremity. The plant which has borne this fruit was struck from a cutting in August last, along with others of the same variety, all of which have fruited



regularly throughout the winter, and are even now bearing freely. I never remember having seen such a case before. A. PETTIGREW.

The Gardens, Cardiff Castle, Cardiff.

[By carefully examining the accompanying illustration, which represents this monstrosity, the leaf-stalk will be seen adhering to the side of the Cucumber nearly to the top, where they separate. Such adhesions in the case of young and tender surfaces are by no means uncommon, though none exactly resembling that illustrated has ever before come under our notice.]

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

The "Sweet" Capsicum.—Pimentos dulcis is the Capsicum grossum (Wildenow) var. monstrosus, and is the sweetest and largest-fruited Capsicum in cultivation. It requires plenty of heat and water, and may be had from the principal seedsmen both in England and France.—INTERNATIONAL.

Rhubarb Grown in the Dark.—The best-flavoured Rhubarb is got in early spring from the open quarters by putting boxes or large garden pots on the plants and covering them up with litter. The sorts I grow for this purpose are Baldry's Scarlet Prolific and Dancer's Early Scarlet. Both these varieties furnish very delicate crisp stalks, and the flavour is far better than when grown in the light.—WILLIAM TILLERY, *Welbeck.*

The Seville Long-pod Bean.—In addition to what was stated (p. 210) allow me to say that it grows to a height of a little over 3 feet. Its leaves are golden-green, and it produces pods some 7 or 8 inches in length and about half-an-inch in width. Each pod contains on an average five or six Beans, which are of a handsome yellow colour, slightly tinged with brown; in shape, they are long rather than large. It is considered of much value as a new vegetable.—V.

Osborn's New Forcing Dwarf French Bean.—After repeated trials in forcing this Bean, together with many other varieties in 1874, and also this season, I find Newington Wonder the only one that rivals it for earliness and good quality. This season I sowed them both on the 27th of January, and gathered the first dish of Beans from Osborn's in forty days and Newington Wonder in forty-two days, the former being most prolific and of the finest quality, either under glass or out-of-doors.—J. NISBET, *Awarby Park.*

Potato Planting Implement.—A correspondent of the "Cultivator" says that he has used one of True's Potato planters for planting his crop of 1874, and considers it one of the greatest labour-saving implements now in use. "It makes the furrow, cuts and drops the Potato, or drops it without cutting, as desired, in drills 18 inches apart, or in hills 3 feet apart, drops the fertiliser, and covers at the same time—doing the work of from twenty to twenty-five men in one day. In experiments made thus far, it has proved a perfect success, and withal a perfect revolution in raising Potatoes. I cannot grow Potatoes cheap without it—with it I can raise them and get them to market for less money than any other crop." Such implements should be worth a trial here.

Dwarf Brussels Sprouts Better than Tall ones.—The past severe weather has proved to one's satisfaction that those hardy kinds of Brussels Sprouts, such as Mein's Victoria and Dalkeith, are valuable vegetables at this season. No degree of cold seems to injure them, and although some seem to prefer a long shrivelled plant, by sowing and planting early, yet I prefer a plant 15 or 18 inches high, and one clothed from bottom to top with buttons. The frost and snow have hardened these, so that when boiled they are as fine as Marrow-fat Peas. It behoves gardeners to plant more of this fine hardy vegetable than is usually done, in order to meet a want much felt at this season after a severe winter. Seed sown in March, and again in the beginning of May, will furnish a supply from October till April.—CHEVALIER.

THE AMATEUR'S GARDEN.

Fruit Garden and Orchard.—The planting of all kinds of fruit trees should by this time be finished, and all recently transplanted trees should be well mulched with littery manure, to prevent undue evaporation from the soil surrounding the roots. All such trees should also be carefully examined, and, if found necessary, should be securely staked. Apple and Pear trees, &c., which may have been headed down, with the view of being re-grafted with improved sorts, may now have that operation performed upon them. All pruning and nailing of fruit trees on walls should now be finished, and protection, in some form, must be given to the bloom, more particularly to that of the Apricot. This protection is accomplished in various ways, and with varying success; but a temporary glass covering is undoubtedly the best. Failing this, however, recourse must be had to such materials as Haythorn's netting, Tiffany, old fishing nets, straw or hay-bands, Fern fronds, Spruce branches, or similar material. Bush fruit of all kinds will by this have been pruned; and the soil may now be slightly pointed, or forked over. As deep digging near to the roots of such plants should be avoided, to prevent as far as possible the ravages of the Gooseberry caterpillar, all round the stems of the bushes should have a good dressing of gas lime; or a thick layer of tan, fresh from the tan-yard, should be applied and allowed to remain throughout the season. Fig trees which may have been unnailed from walls, or other positions, with the view of being protected from frost by means of dry litter, mats, &c., should now be uncovered, and should receive the necessary pruning, and be again nailed in. Fill up blanks, if any, in plantations of Strawberries, and point over the surface of the soil, between the rows, to destroy small weeds, and to offer a somewhat loose surface for early runners (which may be required for forcing) to root into.

Kitchen Garden.—No time must now be lost in getting in the necessary crops; but, except in favourable seasons, little advantage is gained by sowing seeds or planting tubers very early. On examining some Potatoes the other day that were planted early in February, they were found to have made no progress whatever, and, to all appearance, will not be more forward than others of the same kind that were planted a month later. The principal crop, however, of this useful esculent, if not already planted, should now have immediate attention. Late planting, in the case of the Potato, whatever the sort may be, cannot be recommended, as, when disease makes its appearance, it generally attacks all, in whatever stage of growth they may happen to be in; and if the tubers are in a tolerably advanced condition, the crop consequently suffers less injury. Established beds of Asparagus should now have a portion of the surface-soil removed into the alleys, where it should be dug in, while the surface of the beds themselves should have fresh soil, a dressing which should be followed by a liberal application of salt. Besides being a suitable manure for Asparagus, salt also, to some extent, prevents the growth of weeds, and destroys or drives away slugs and other depredators. Where fresh plantations of this esculent are intended to be made, the beds for the reception of the roots should by this time have been duly prepared, and the planting should be done as soon as the plants have commenced to grow, or when they have made shoots of about an inch in length. Plants one year old are generally found to be best for this purpose, and one-year-old plants of the variety known as Conover's Colossal will be found to be in all respects equal to two-year-old plants of the common kind. Some prefer sowing seeds upon the prepared beds at once, and afterwards thinning out the plants to the proper distances apart, which should be 18 inches. Remove the littery matter which may have been placed around the stools of Globe Artichokes for protection, and thin out the offsets, or suckers, which may be used, if required, to form fresh plantations. Jerusalem Artichokes should also be planted now, and, as these attain a considerable altitude, they should be planted in lines not less than 6 feet apart. They will grow and succeed well in almost any kind of soil, and are sometimes found useful during the summer for concealing unsightly objects. The principal crop of Broad Beans should now be sown to succeed the first crop, which will possibly be the early Green Mazagan. This should be succeeded by the Long-pod or the Green Windsor. In small gardens some of the dwarf sorts are also very suitable. Continue to make sowings of the various kinds of Marrow Peas. The tall-growing sorts are most productive, but the dwarfs, or sorts which grow from 3 to 4 feet in height, are the best suited for small gardens. There are now in cultivation so many excellent varieties of this delicious vegetable, old as well as new, that it would be invidious to name any particular sorts; to make sure, however, of really good crops on light land, during dry seasons, it is advisable to sow in trenches, as if for Celery, at the distance of 6 feet from row to row; or, the Pea crop may, with advantage, be made to follow Celery. Sow in the same position the Celery occupied; and whatever goodness the latter may

have left in the trenches will be sure to be sucked up by the Peas; and round Spinach should be sown between the rows. Parsnips should have been sown in February; as should also have been Parsley, the seed of which is somewhat slow to vegetate; but if not already sown these should be at once attended to. Cauliflowers should be sown in a slight hotbed, to succeed the autumn-sown plants. Leeks, Brussels Sprouts, and the various kinds of Kale, should have been sown early in the present month; while the various sorts of Broccoli should be sown now, together with Savoy and Cabbages, &c. Plants of the latter, from beds sown last August, should now be planted out, as should also Cauliflower plants from hand-glasses or frames, or from sheltered positions under walls. The first crop of Early Horn Carrots should be sown in a frame on a slight hotbed early in February, and a bed of the same sort should be sown on a warm border about the first week of the present month. The general or principal crop (which may consist of the Altringham, Red Surrey, or Long Orange sorts) may be sown now, should the soil be found to be in good order for its reception, or it may be deferred until the beginning of next month. There is an old saying with regard to the early crop of Turnips, viz., that they will be sure to bolt or run to seed if sown before Lady Day; a small sowing, however, of the Early Stone variety may be made now upon a warm border facing the south. Also a good breadth of the White Turnip Radish, and when these become too large to be used as salad, they will be found to be a good substitute for young Turnips. The principal crop of Onions if not already sown, should be got in now; and, where Potato-Onions are grown, they should now be planted, together with Shallots and Garlic, should these not have been planted in October. Continue to transplant autumn-sown Cos Lettuce, and to prick out, in a sheltered position, or in a frame, young plants of the summer sorts which had been sown in heat in February; commence, too, to sow, on a warm border for summer use, the Paris green and the Paris white Cos varieties, as well as some of the many Cabbage sorts. Attend to the blanching of Seakale, and take care to prevent the material with which the pots are covered from becoming too warm. For this purpose tree-leaves are possibly best suited; but stable manure of any kind will answer the same purpose. Make fresh plantations, if required, selecting for the purpose good and richly-manured soil; and seedling plants one year old are to be preferred to older kinds. If the Cucumber-bed is in proper condition, the plants may now be put out, if this has not been already done. Unless it be in gardens where the necessary appliances of pipes and hot-water tanks for bottom-heat are in existence, it is more economical to purchase plants fit to plant out at once, than to attempt to raise them so early in the season; but, as the pit or frame will now be fairly at work, Melon seeds may be sown, if desired for an early crop. A small sowing of white Celery would probably be made in heat, during February, for early use; and such plants may now be sufficiently forward to be pricked into seed-pans or boxes, or they may be potted singly into small pots, and gradually hardened off. The present is also a suitable time to make the principal sowing, in a gentle warmth; the Sandringham White and the Leicester Red are two of the best sorts. Tomatoes, Capsicums, Sweet Basil, Sweet Marjoram, Ridge Cucumbers, Vegetable Marrows, &c., may be sown now in gentle heat. It is quite unnecessary to sow such things earlier than about the present time, as they cannot be planted out earlier than the end of May, and they are by no means benefited by long retention in pots.

Pleasure Ground and Flower Garden.—Attend carefully to lawns and Grass belts, &c., extracting all such broad-leaved plants as the Plantain, Dandelion, &c.; and soon after rainfall, or when the turf is in a soft, spongy condition, let all be well rolled with a heavy iron roller. Wherever it may be found necessary, Laurels and other evergreen shrubs and trees may now be pruned. This pruning should consist of using the necessary means to keep the various plants in proper form, &c., by stopping or removing, in the case of Coniferous and other trees, rival leaders, and in preventing the more delicate or dwarf-growing varieties from being injured or smothered by stronger-growing sorts. Spring flowering plants and bulbs, occupying beds in the flower garden, will, in many instances, be in full flower, and should have every necessary attention; the turf, gravel walks, &c., should also all be kept scrupulously clean, and should be frequently rolled. In some instances it is already necessary to commence mowing, and the margins of walks and borders should now be cut with the edging knife.

Forcing Houses and Vineries.—The fruit will now require to be thinned in the early house; the bunches must be carefully thinned in the first instance, and care taken to avoid a too heavy crop remaining upon the Vines, more particularly if they are not in a strong and vigorous condition. In selecting the bunches to be retained endeavour, so far as possible, to leave them at such distances from each other as to give a regular

and uniform appearance to the crop, but in no instance should more than one bunch be left upon a spur; and the spur or shoot should also be stopped at the first or second joint beyond the branch. The berries of each bunch should also be carefully thinned out, having reference to the particular kinds in question, and to the size such berries are likely to attain. Handling the fruit more than is really necessary must be avoided. Watch carefully for any indications of mildew; and, if any such appear, have recourse at once to sulphur in some of its forms. Ewing's Infallible Composition is a certain and easily applied remedy. Although the weather has, to all appearances been anything but favourable for the setting of early forced fruit, Peaches and Nectarines have set in great abundance, and will require immediate attention in thinning out, and, to keep the trees in a clean and healthy condition, the syringe must be freely used upon them. Straw-berries in pots, which have been gently forced, will now be getting ripe, syringing must be discontinued, manure-water must be withheld, and the ripening fruit must be supported with a stake, to prevent it coming in contact with the soil. In orchard-houses the Apricot trees will still be in full flower, and should be kept as dry as possible, and during very cold nights, such as we are occasionally experiencing, might, for greater safety, have a piece of Tiffany thrown lightly over them; but, when there is no apparent danger from frost, the ventilators may, to some extent, be open by night as well as day. Peaches, Nectarines, Cherries, &c., are also in bloom in these structures, and should have abundance of air whenever the weather is sufficiently mild, and, as soon as the fruit is fairly set, the syringe, or the more powerful garden-engine, must be used vigorously, to keep them free from insects of all kinds, and, if this cannot be accomplished by this means, recourse must be had to fumigation, as aphids and red spider must necessarily be subdued, at whatever cost.—PETER GRIEVE.

ORIGIN OF BRAZIL AND SAPUCAYA NUTS.

THE particular tree which yields the Brazil Nuts is separated by Mr. Miers from the older species of *Bonpland*, *Bertholletia excelsa*, under the name of *B. nobilis*, distinguished by its loftier growth, its immense trunk bare to a great height, stouter branches, leaves of a more rufescent hue, with more numerous closer nerves, more reticulated, or much shorter petioles; in its broader panicle with several long branches spreading horizontally; and in the rounder and more entire lobes of the calyx. The quantity exported from Pará alone amounted in six months of the year 1833 to 18,862 alquieres, and from Manáos, on the Rio Negro, to 9,976 alquieres. This would correspond to an average annual export of $2\frac{1}{2}$ millions of the fruits, or 50 millions of the seeds, measuring about 60,000 bushels; and this does not include the large quantity exported from the Rio Orinoco, Demerara, Cayenne, Maranhao, and other places. Their value in Brazil is about 30s. per bushel. The hard fruits which fall to the ground are broken in the forest by Indians, where a man and a boy will break about 300 of them daily. The kernels of these Nuts, broken in a similar manner, are subjected to pressure, when they yield an oil greatly esteemed for domestic purposes and for export, each pound of the kernels yielding 9 ounces of the oil, valued at 2s. per lb. This oil consists, according to Martius, of 74 per cent. of elæine, and 26 per cent. of stearine. The finely laminated inner bark of the trunk is

also a valuable article of commerce, especially adapted for the caulking of ships and barges, being worth about 18s. per cwt. The tree is about 130 feet high, with a trunk 14 feet in diameter up to a height of 50 feet, and quite bare to the height of 100 feet; its leaves are from 10 to 15 inches long; the fruit globular and 6 to 6½ inches in diameter. The question naturally arises, How do the seeds germinate and strike root, confined as they are in the pyxidium as in an inextricable prison? It is evident that they cannot find an exit through the opercular opening; nor can they escape by any other means than the rotting on moist ground of the pericarp which is three-quarters of an inch thick. It probably requires three years' exposure to the sun and moisture before so thick a shell could decay sufficiently to allow of the liberation of the seeds, and then, perhaps, another year's exposure before the thick testa of the seeds could rot sufficiently to allow the embryo to germinate. This shows an extraordinary power of vitality in the embryo, which seems to remain four or five years in a dormant state. Oily seeds are generally supposed to ferment and decay soon, but that is perhaps, Mr. Miers suggests, when the oil cells are contained in albumen; here, however, we find a reverse condition. It is stated that when an embryo of the *Bertholletia* is extricated and planted under the most favourable circumstances, it takes a whole year before it begins to germinate; this may possibly be due to the large amount of stearine in the oil-cells, which, in a great measure, preserves it from decay. The tree which yields the Sapucaya Nuts of commerce is separated by Mr. Miers from *Lecythis ollaria* of Linnæus, and *L. zapucaya* of Aulet, and named *Lecythis usitata*.



The Fever Gum Tree (*Eucalyptus globulus*).

THE FEVER GUM TREE.

THE accompanying illustration represents a young tree of *Eucalyptus globulus* or Fever Gum tree, a species about which much has lately been written. Both in Tasmania and Australia this Gum tree grows with wonderful rapidity. In the former colony specimens of it often attain a height of 300 feet, whilst trees of it from 200 to 250 feet are comparatively common. The Australian colonists distinguish many of the trees of this genus by characters derived from the bark; some having smooth, others rough or cracked bark; some are solid (Iron-bark), while others are fibrous (Stringy-bark); and, finally, in some species the bark scales off in flakes, either from the whole tree or from the upper part only. They are also called Gum trees, in consequence of the quantity of gum that exudes from their trunks. The timber is exceedingly valuable, and is in common use in our Australian and Tasmanian colonies. In the latter, the three following species yield the best quality of timber, namely:—*E. globulus*, the Blue Gum; *E. gigantea*, the Stringy-bark; and *E. amygdalina*, the Peppermint tree. But of these the first-mentioned is considered the most valuable, although the Stringy-bark attains the largest size. *E. globulus*, we fear, will not withstand exceptionally severe winters, even in the most southern parts of England; but its beauty when young, both as regards foliage and habit of growth, renders it well worth a place in our gardens. It is easily obtained, grows rapidly, and, if cut down at any time by frost, can readily be renewed. Sixty plants of it, planted at Chiswick in 1847, grew rapidly, and were uninjured by the winters of 1847-8 and 1848-9, but were destroyed by a severe frost in January, 1850.

DEW AND MOISTURE IN THE AIR.

THE moisture always present in the atmosphere is to be traced to evaporation by which liquid water is changed into an invisible vapour. The rapidity with which evaporation occurs depends upon a number of circumstances. Since at all temperatures lower than the boiling point of a liquid its vapour escapes from the upper surface only, the greater the extent of this surface, the more rapid the evaporation. Then, again, the higher the temperature of the liquid, the greater its repulsive power, and, consequently, the more energetic its evaporation. The pressure of the atmosphere upon a liquid surface must also, as already explained, effect the formation of vapour; the less this pressure, the more rapid the evolution of vapour. All liquids capable of forming vapour at ordinary temperatures, vapourise almost instantly in a vacuum. The capacity of the air for moisture, however, is limited, and when as much vapour has passed into the air as it is capable of holding or, in other words, when it is saturated, all evaporation ceases. The quantity of moisture already present in the air will then necessarily affect the rapidity of evaporation. Renewal of the air is also favourable, since, when no wind is stirring, the lower strata become saturated with moisture, and then all further evaporation ceases until the excess is distributed through the upper and dryer layers by gradual diffusion. The capacity of the air for moisture increases very rapidly with the temperature. The following table gives the weight in grains of the aqueous vapour contained in a cubic foot of saturated air at different temperatures, according to a writer in the "Exchange and Review."

° Fah.	Grains.	° Fah.	Grains.	° Fah.	Grains.	° Fah.	Grains.
0	0.545	30	1.969	60	5.765	90	14.810
10	0.841	40	2.862	70	7.992	100	19.790
20	1.298	50	4.089	80	10.949	109	25.429

Silliman gives the following law:—"For every 27° temperature above 32° the capacity of the air for moisture is doubled." For example:—A body of air, when saturated, contains, at 32°, the 160th part of its own weight of vapour; at 59°, the 80th part; at 86°, the 40th part; at 113°, the 20th part;—or, in other words, as the temperature increases in an arithmetical series, the capacity for moisture increases in a geometrical series. We distinguish between the absolute and the relative humidity of the atmosphere. By the absolute humidity, we understand the quantity of vapour actually present, irrespective of temperature; by the relative humidity, the quantity present, as compared with that required to completely saturate the air. Thus, suppose the air, when at the temperature of 80°, contains but 5.475 grains of moisture—since at this temperature it is capable of holding twice as much, or 10.949 grains—we say that its relative humidity is 50 per cent., or half. If, now, the temperature of the air be increased to 100°, without the addition of any more vapour, then the relative humidity becomes 25 per cent., or one-fourth; since at this temperature the air would hold, if saturated, nearly four times the amount it actually contains. Should, however, the temperature be lowered, the relative humidity increases, until at last the air becomes saturated, and condensation begins, which, as the foregoing figures show, would be nearly at 60°. In general, any temperature at which saturation is reached is called the dew point, which, for air containing 5.765 grains, is exactly at 60°; for air containing 19.790 grains, is at 100°. As a rule, the air over the ocean is always very near its point of saturation; that over the continents, on the contrary, contains, on an average, but three-fifths of the moisture it would hold if saturated. By the incessant action of the winds, and the diffusion of gases, the excess of vapour over the ocean is continually being distributed over the surface of the continents. By these means we generally find that the total quantity of moisture decreases from the coasts of the continents towards the interior; it also decreases from the equator towards the poles, on account of the decrease of temperature. Peculiarities of surface and situation produce great differences in the quantity of vapour generally present in the air above any given place. Thus, Great Britain, bathed by the moist, warm air of the Gulf Stream, has its atmosphere generally near the point of saturation, while the arid steppes of the great Mongolian Plateau, in Central Asia, hemmed in by the huge marginal mountains, is swept by thirsty winds that hold but 15 to 20 per cent. of the vapour they could hold if saturated. Having thus briefly discussed the preliminary principles which regulate the quantity of moisture in the air, we are now in a position to readily understand the manner in which the invisible vapour becomes visible. We name collectively, precipitations, any of the various forms in which the moisture is condensed; for example—mist, fog, cloud, dew, frost, rain, snow, or hail. Now it is evident that whenever the air is cooled below the temperature of its dew point, the moisture it can no longer hold must become visible in one or the other of these forms of precipitation. The particular shape assumed by the condensed vapour depends upon peculiarities of cooling, the amount of reduction of temperature, and the absolute humidity of the air previous to its cooling. It is our object in the present article to consider that

peculiar form of deposition known as dew. When the air is very near the point of saturation, a slight reduction of temperature will occasion the deposition of its moisture. Ice water, or cold spring water, poured into a vessel, will so chill the air that comes in contact with the outside as to cause it to deposit its moisture. Such is the origin of the minute drops that almost immediately collect on the outside of vessels containing cold water. The phenomena of dew is of an exactly similar nature; the moisture of the air being condensed by the reduction of temperature, which is caused by the cold objects on the surface of the earth. Let us examine carefully the manner in which this reduction is produced. The law of the reduction of temperature of the air, with the increase of distance from the earth's surface, is only generally true during the daytime. At night—especially when the sky is free from clouds, and the preceding day has been moderately warm—the air at a short distance above the ground will be considerably warmer than that in almost immediate contact with it. Of two exactly similar thermometers—one placed on a bed of leaves, or some other non-conducting substance, and the other suspended a short distance above the ground, the former will mark the lower temperature; the leaves radiating their heat into space, cool the air near them considerably lower than the stratum in which the upper thermometer is suspended. Radiation into a cloudless sky will often cool the air near the surface from 6° to 10° below the temperature of the upper layers.

The formation of Dew.

The cause of the formation of dew is simple. During a moderately warm day in autumn the air becomes heavily charged with moisture; at night, the objects on the surface of the earth, radiating their heat into the air, soon acquire a temperature considerably lower than the air. When, then, the air comes in contact with these colder objects, its temperature is lowered, and if the reduction be continued below the dew point, the moisture will be deposited as dew on the objects causing the chilling. The foregoing theory of dew was propounded by Dr. Wells, of London, who was born in South Carolina. Though seemingly simple, now that the true explanation has been out, it was only discovered by Wells, in all its completeness, after long years of patient and continuous study; indeed, it may even be said that the discoverer gave his life as the price of his discovery, since frequent exposure to the chilly air brought on a series of colds that resulted in his early death. It cannot have escaped the notice of all gifted with but ordinary powers of observation, that the amount of dew found in the mornings on different objects varies considerably. The vegetation, for example, will often be drenched with it, while the road bed, the bare rocks, or soil, contain little or none. Differences, too, are observable in the amount found on particular kinds of vegetation; shrubs, trees, and Grasses having received varying quantities. These differences are to be ascribed to the varying rapidity with which objects lose their heat by radiation, and, consequently, in the degree to which they reduce the temperature of the air. Dr. Lardner suggests a very beautiful experiment, which may well repay our readers to repeat for themselves, with such modifications as circumstances may require. Place a clean glass cup in a bright silver basin (a tin one will answer all purposes), and expose both to the air overnight, during the season of the year that dew is deposited. In the morning the glass vessel will be covered with dew, while the metallic basin will contain none whatever. If, now, the experiment be repeated, and a silver mug be placed in a glass basin, and exposed to the air, the basin will be found covered with dew, while the cup will be free. The explanation is simple. Of the two substances—the glass and the metal—the former is much the better radiator of heat; hence, its temperature being colder than that of the metal, the dew is deposited on it in preference. It is a general law that, as regards the surface action of matter, bodies that are good absorbers of heat are almost equally good radiators—the same peculiarity of surface that allows the heat to enter the mass of the substance, allowing it equally well to pass out again by radiation. That condition of surface, however, which favours the reflection of heat, must necessarily be opposed to radiation, since the heat being reflected is not able to enter the body. The metals, as a class, are all good reflectors, especially when polished, and are consequently poor radiators. But a small amount of dew should therefore be deposited on them, as compared with that found on other objects. The deposition of dew becomes, then, a kind of natural thermometer, enabling us to see, from the quantity found on different objects, the relative reduction of temperature they have attained through radiation. But it may sometimes be remarked that of two different pieces of the same substance placed near each other, one contains a larger proportion of dew than does the other. A close inspection will generally show that one of them is separated from the ground by some good non-conductor, while the other is in direct connection with it. So circum-

stanced, although their radiating powers be exactly the same, the first must soon grow colder than the second, since it has only its own heat to lose, while the other is continually receiving additional heat from the ground. To the occasional bedding of ashes on which some streets and pavements are laid, in default of the more substantial gravel, must be attributed the greater deposit of dew in some streets than in others, or even occasionally on particular stones in the same street. A much greater quantity of dew is deposited in clear nights than when the sky is covered with clouds. On cloudless nights, nothing exists to check free radiation into space; objects, therefore, become considerably colder than the surrounding air, and thus produce a much greater reduction of its temperature, and receive a correspondingly heavier deposit of dew. When, on the contrary, the sky is overcast, the heat radiated from the objects striking the clouds is reflected from them back again to the objects, thus raising their temperature. This is the popular explanation. To be more precise, the clouds radiate their heat to the earth as well as reflect the terrestrial radiation, and by this mutual exchange of heat the reduction of temperature is considerably lessened. With a cloudless sky, the heat of the ground is so much higher than that of celestial space, that the radiation therefrom to the ground is almost inappreciable. Considerable differences in the amount of the deposition are observable between night when a strong wind is blowing and when it is entirely absent; a greater quantity is always found after a calm night than after a windy one. Although terrestrial objects may lose their heat by radiation, the air does not remain in contact with them long enough to suffer any very appreciable reduction of temperature; on the contrary, on a calm night, copious deposits are possible, since the air has an abundance of time to lose its heat. Between perfectly calm nights and those during which gentle breezes are stirring, the maximum deposition occurs in the latter, since, when the air is perfectly still, no cause exists to renew the air, and when the comparatively thin stratum in the immediate neighbourhood of the object has deposited its moisture, all further deposition ceases. More dew falls in the suburbs or in the open country than in the heart of a city, since in the latter, although the objects in the street lose their heat by radiation, a marked reduction of temperature is prevented by radiation from the walls of the neighbouring houses. On the house tops, this retarding influence of mutual radiation is diminished, and about the same quantity falls as would at an equal elevation in the open country. On very clear nights, when the atmosphere during the day time has been very near its point of saturation, radiation may take place with such rapidity that a considerable depth of air may be reduced below the temperature of its dew point.

Dew resembling a gentle fall of Rain.

This is common in our latitude during many autumnal nights. Places situated near the sea have, of course, more dew than those in the interior of the continents. This is a necessary result of the greater evaporation that occurs over the ocean. Great Britain, as we have already mentioned, has, in general, a nearly saturated air. We find, accordingly, that its annual dewfall is unusually large; it amounts, on the average, to nearly 5 inches, which bears a sensible proportion to its entire rainfall. In the tropics, too, where evaporation reaches its maximum, very large depositions of dew occur. At times they resemble, in their intensity, the gentle showers of the temperate regions. Along the desert of Atacama, on the western coast of Peru, is a strip of land where rain never falls. The absolute sterility which would thereby be occasioned is somewhat mitigated by the dew that often descends in large quantities. Further to the north and south, along the coast where the sterility is not so marked, the dew supplies very well the place of rain. When the temperature of terrestrial objects has been lowered by radiation below the freezing point, the moisture is deposited in the form of ice, and is then known as frost. It has often been a matter for surprise to some that frost is frequently found when the temperature of the air, as indicated by a thermometer hung some little distance above the ground, is appreciably higher than the freezing point. This will be understood when it is remembered that it is only the air in immediate contact with terrestrial objects that had its temperature sensibly affected by their radiation, and that, therefore, the layers of air quite near the surface, may have a temperature considerably lower than the freezing point. Indeed, frost may often be noticed in the morning, when the temperature of the air, as marked by a self-registering thermometer, has not fallen throughout the night nearer the freezing point than 5° or 6° . In such instances we will generally find that the objects on which the frost appears are not only good radiators, but, as well, poor conductors, or at least rest upon good non-conductors. For example, rough boards are frequently covered with frost, when other objects are comparatively free from it. They owe their greater reduction of temperature to their good

radiating and non-conducting powers. Generally, when frost occurs, the temperature of the objects does not fall very appreciably below 32° ; so that but slight coverings will protect plants during the cool autumnal evenings. Coarse straw matting loosely wrapped around the plant, or even if stretched awning-like over it, will effectually prevent any serious effects of frost. This protection is clearly not to be ascribed to any non-conducting power of the matting, but rather to the obstacle it offers to the rapid loss of heat in the plant by radiation. Its effect is precisely similar to the action of the clouds in preventing a considerable deposition of dew.

Frost on Windows.

An excellent illustration of the deposition of frost may be obtained from the frozen moisture so commonly found on the inner surface of the panes of glass in bedroom windows, when the temperature of the outer air is lower than 32° . The cause, of course, is to be attributed to the cooling of the air in the room by the colder air outside. Now, an exceedingly neat experiment may be made, with but little trouble, by which the effect of radiation on the deposition of frost can be studied. Cut out two small pieces of tin-foil, and fix one on the inside of the window and the other on the outside, observing to place them on different parts of the pane, so that they may not face each other. In the morning it will be observed that the deposit of frost is appreciably thicker on the piece of tin-foil that is on the inner surface of the pane than on the rest of the window, while it is entirely wanting on that portion of the glass covered on the outside by the tin-foil. Clearly, therefore, the inner tin-foil must have made that part of the glass under it colder than the rest, and the outer foil the portion under it warmer. The explanation is as follows:—Tin-foil is a good reflector of heat, and, consequently, a poor radiator. The foil on the inner surface of the pane allows the glass beneath it to grow colder than the surrounding portions, by the protection it affords to the heating of the glass by radiation from the apartment, since it reflects nearly all the heat of the apartment that would otherwise have passed into the glass at this point. On the contrary, the foil on the outer surface of the glass prevents the radiant heat of the apartment from escaping through the glass at this point.

GARDENING FOR THE WEEK.

Trees and Shrubs.

PREPARATIONS should now be made for transplanting all kinds of evergreens, so as to be ready to commence operations the moment the cold drying March winds are over. Where there are large quantities to transplant, such things as Rhododendrons, Aucubas, Box, and others that always lift with good balls, may be commenced with at once with the greatest safety. This will allow more time and strength to be concentrated on others later on that do not transplant so well, and therefore require more attention. The ground should be trenched at least 2 feet deep before planting, if at all hard, unless the plants are to be placed at wide intervals apart, in which case large holes will suffice. These should be dug much larger and deeper than is necessary to receive the ball of the plant, so as to thoroughly break up the soil and allow the roots plenty of freedom. This is of the greatest importance to the future growth and well being of the plant, as it is impossible for it to make satisfactory progress if the soil immediately surrounding the roots is hard and impenetrable, or too stiff and retentive. In both cases, therefore, it is necessary that it should be thoroughly broken up so as to ensure rapid and satisfactory growth. Should the natural soil be at all poor, the plants will be much benefited by filling in the holes with fresh loam, such as may be obtained from an old bank or pasture. This will start them into free growth, and assist them materially in getting over the check incurred through removal. In covering the roots the soil should be well washed in among them as the operation proceeds by using plenty of water, which should be thrown in with considerable force. By so doing, any vacancy that may occur under the ball, or amongst the roots, will be filled up much better than can be accomplished by treading, and it is of the greatest importance that these cavities should be well filled up, so as to exclude air and get the soil settled and properly consolidated. In forming new shrubberies, the plants intended to be permanent should be placed at a sufficient distance apart to allow room for their proper development without unduly crowding each other. The distance necessary for this will, of course, depend on the kinds used, and the size which they are known to attain; but it may be roughly stated at from 20 to 30 feet. Shrubs of all kinds are too often mixed up indiscriminately, without regard to size, habit, or character. The proper way is to make a selection of the best and most ornamental, and fix on the sites, having due regard to their height, character, and general suitableness to the position which it is intended they should occupy. It is far better to have

fewer varieties than it is to have an heterogeneous mixture that does not associate in a pleasing and satisfactory way, and this seldom occurs if there are too many varieties mixed up together without some design and forethought as regards harmony and effect. Having arranged and planted the permanent plants at proper distances apart, the intervening spaces may be filled in with any of the common kind, and these can be removed, as occasion requires, to make room for such as are of more value. By planting in this way an immediate effect is produced; and it has the double advantage of affording a good supply of large plants to meet the various wants that occur from time to time in most places. The different kinds of resinous plants, except Larch, transplant better in April than any other time of the year. For ornamental purposes, to plant as single specimens, the following are the handsomest and most distinct:—*Picea nobilis*, *Nothmanniana*, *grandis* pinsapo, and *cephalonica*. The latter, on account of making its growth rather early, is occasionally injured by late spring frosts. To obviate this, it should, if possible, be planted where the morning sun does not reach it, as then the growth will be later, and the frost will pass off without any ill effects. Where the soil and situation suit it, this is one of the handsomest and most symmetrical of Conifers. The Douglas Fir (*Abies Douglasii*) should be planted extensively for timber; its growth is very rapid, and the wood heavy, solid, and very resinous, and there can be no doubt of its great value and lasting qualities. The Hemlock Spruce (*Abies canadensis*) is valuable as an ornamental tree, on account of its light silvery foliage and graceful pendulous habit, but it should be planted where its roots can find a good supply of moisture. Among Cypresses, *Cupressus Lawsoniana* and *Lambertiana* may be mentioned as fast growing distinct varieties that are sure to give satisfaction. *Sequoias sempervirens* and *Taxodium distichum* should be in every collection. Few deciduous trees equal the latter for ornamental purposes. In summer the leaves possess a peculiarly pleasing shade of green, and in autumn they are unsurpassed for the warmth and richness of their colouring. *Thuja borealis* and *dolabrata* are very desirable fast-growing plants, and exceedingly ornamental. Among *Thujas*, *Lobbii* and *gigantea* are the largest and most stately. The different forms of Variegated Yew (*Taxus*) are most valuable on account of their medium growth and rich colouring. When making their young wood in spring they present a striking appearance.

Ornamental Foliage and Flowering Shrubs.

As regards large or otherwise strikingly or namental foliage among shrubs, the following stand foremost in the rank, viz., *Aralia Sieboldi*, a plant that should be in every garden, being exceedingly ornamental, and having proved itself to be sufficiently hardy to stand very severe winters. It has rich, glossy, deeply-cut green leaves, much resembling those of the Fig in form, and is highly prized for sub-tropical work and indoor decoration in winter, and for halls, corridors, and such like places, it has few equals. *Berberis Bealii* and *nepalensis* are likewise valuable on account of their large, rich glaucous green leaves. *Bambusa gracilis*, too, is one of the most elegant plants which we possess, and is very suitable for the margins of ponds or for planting on sloping banks. *Osmanthus ilicifolius* and its variegated form, are likewise distinct and ornamental. *Eurya latifolia* variegata is said to be quite hardy; but it is so good for winter decoration indoors that I have not yet ventured it outside. Several of the *Euonymus* are deserving of pot culture for indoor decoration, and almost rival the *Crotons* for richness of foliage; and they are even more serviceable, on account of their hardiness. Among flowering shrubs, the following are sure to give satisfaction, viz., *Abutilon vitifolium*, with its fine Vine-shaped leaves and large Mallow-like flowers. It is, however, a little tender, and should be planted on sheltered situations. *Berberis Darwinii* and *stenophylla* are both gems, either to grow in the form of shrubs, or for covering low walls, being equally beautiful when in bloom, or laden with their rich metallic blue berries. *Arbutus Unedo* is a universal favourite, and one of the most useful and ornamental shrubs which we possess. The dry seasons have just suited this, as it has been laden with its beautiful Strawberry-like berries. *Rhus Cotinus*, with its lovely plumes of feathery-like inflorescence is also a charming plant that should have a place in every shrubbery. It should be placed in the full sun, or the plumes do not assume the rich tints of colour that add so much to their beauty. *Garrya elliptica* is another very ornamental evergreen, having flowers arranged in catkins, like those of the Hazel. These make their appearance in February. While the plant in its growth and foliage might be mistaken for the Evergreen Oak, like that tree it is very difficult to transplant, and should, therefore, be obtained in pots. For low south walls, *Ceanothus azureus* and *Escallonia macrantha* are two of the best shrubs we have. For the same situation, *Magnolia grandiflora*, with its noble foliage and highly-scented flowers, is a grand plant, where it has plenty of

room and a light dry soil in which to grow. In the south and south-west of England this succeeds well as a shrub on the open lawn; and at Kings Weston there used to be some noble specimens. The old double Furze (*Ulex*) is deserving of extensive planting, as it will succeed in poor soils where little else will grow; and, when in bloom, few things are more striking.—J. SHEPPARD, *Woolverstone Park*.

Flower Garden and Pleasure Grounds.

Look over all newly-planted trees and shrubs, as, in some instances, staking or treading in may be found to be necessary, where the plants may have become loosened through wind-moving; and, if the weather continue dry, copious waterings will also be necessary. In performing this operation a basin should be formed round the stem of each plant, in order to confine the water where it is required, and the sides of this basin should be levelled in as soon as the water given has disappeared, so that the dry soil may, as far as possible, prevent evaporation. Let lawns, grass belts, and verges be swept thoroughly clean, and afterwards repeatedly rolled with a heavy roller, while the turf is yet in a soft and somewhat spongy condition; for, if this is delayed until the weather sets in dry, the roller will make comparatively little impression upon it. Gravel walks should also be neatly edged and frequently rolled, as nothing tends more to give an appearance of finish and neatness to a garden than careful attention to this matter. Spring bedding plants will soon need attention; the beds and borders containing them should be kept scrupulously clean, and all their surroundings rendered as enjoyable as possible, as their season, it must be remembered, is necessarily somewhat restricted. The weather, too, has been hitherto so unfavourable for the early development of spring flowers that many of the finest will be later than usual in flowering this year. In the herbaceous ground the various varieties of Phlox and Pentstemon may now be planted out. Both these genera have, within the last few years, been so greatly improved that they are now well worthy of any extra care and protection which may be afforded them in winter, especially the Pentstemons, some of which are not altogether hardy. It is, therefore, advisable to insert cuttings of these plants early in autumn, under a hand-glass or in a frame, to pot them off as soon as they are well rooted, and to winter them in a cold pit, and plant them out in beds, or as single plants, on the herbaceous border about this time of year. Plants of the beautiful *Dielytra spectabilis*, and its white-flowered variety, although quite hardy, so long as they are in a state of rest, are, nevertheless, very liable to be disfigured by spring frosts, and should have a slight protection of some sort whenever there are indications of the thermometer falling below the freezing point. Continue to gradually harden off the various kinds of bedding plants, and, wherever the stock of any variety may be considered insufficient, let such be increased by means of cuttings as rapidly as possible. The various kinds of *Alternantheras* will now, if placed in a moderately high temperature and moist atmosphere, produce an abundant supply of cuttings, which will root freely in a mixture of sharp sand and finely-sifted leaf soil, in 6-inch or 8-inch pots, which should be placed under hand-glasses, or in a close propagating-case, in a stove temperature, where they will root in the course of a week or ten days. They should then be placed in a more airy situation, and will not require to be potted off, but may be allowed to remain in the pots, in which they were inserted as cuttings, until the time arrives when they may be planted in the beds.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Plant Stove and Greenhouse.

Stove and greenhouse plants of all kinds should now be re-potted, not necessarily into larger pots, unless these be required; but the soil, &c., in which such plants are growing, should be carefully examined at least once every season; and this is a suitable time for such operations. See, therefore, that the drainage is in all cases efficient, as, without this necessary condition, no plant in a pot or tub can long remain in health. Of all winter-flowering plants, the various varieties of the *Camellia* are, perhaps, the most appreciated. The flowers, however, which they may produce after this time, are of less value than those which expand during mid-winter; and, in order to induce, as far as possible, an early habit of blooming, the plants, or, at least a portion of them, should now be re-potted or surface-dressed, as may be found necessary, and any blooms or unexpanded bloom-buds remaining upon them should be rubbed off. The plants should then be placed in a moist and tolerably high temperature, such as that of an early Vinery, where they should be freely syringed once or even twice each day, in accordance with the state of the weather; and, as the drainage will have been set right, they should also be freely watered at the roots when they require it, as drought is extremely injurious to them. The partial shade of Vines during the time when *Camellias* are making their fresh growth will be found to be beneficial to them rather than otherwise. These plants are frequently grown in a mixture of

peat and loam. Possibly, however, good fibry peat alone, in a somewhat rough condition, is the best material in which to grow them; while the broken up roots of the common Ling, or Heather, is an excellent material to place in the bottom of the pots, to act as drainage. In the propagating-house or pit, bedding plants of all kinds should be increased by means of cuttings or otherwise, as rapidly as possible, until the requisite quantity of each sort is secured. Bedding Pelargoniums, in small pots, should now be shifted into pots of larger size, and rooted cuttings of the same in store pots should be potted off singly. Such kinds as Blue Lobelia and the Golden Feather Pyrethrum, sown early in February, will now require to be pricked out into seed-pans or boxes, where they may remain until they are required for planting in the flower-beds. Various kinds of tender and hardy annuals may now be sown in a gentle warmth in pots or pans, to be afterwards pricked into boxes, &c., and the hardy species should be finally planted out where they are to flower early in May, and tender kinds, such as the Celosias, &c., should be shifted into their flowering pots.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Bouquet Flowers.

Amongst other blooms at present obtainable for bouquet making may be enumerated the following, viz., Azaleas, Bouvardias, Camellias, Carnations, Cinerarias, Cyclamens, Deutzias, Ericas, Encharis, Euphorbias, Fuchsias, Gardenias, Heliotrope, Hyacinths, Heaths, Lily of the Valley, Mignonette, Narcissus, Pelargoniums, Primulas, Roses, Snowdrops, Spiræas, Stephanotis, Violets, and white Lilac. Button-hole bouquets consist generally of a Rose-bud, a half-blown Camellia or Gardenia, and some other smaller flowers. A pretty flower for these miniature bouquets is the blue Forget-me-not, obtained by lifting a few clumps of it from the open ground, potting them, and placing them in a warm house, where they speedily open their blooms and afford a stock to cut from. If placed with a Gardenia, the blue Forget-me-not forms an effective contrast; but, with such a selection as I have enumerated above, both hand and button-hole bouquets may be made to suit all tastes.—A. HASSARD, *Upper Norwood.*

Indoor Fruit Department.

Vines.—It sometimes happens that a few bright hot days about this time cause the buds in late Vineries to burst into leaf without the assistance of fire-heat. When such is the case, and low temperatures occur afterwards, the young shoots are sure to receive a check, unless strict attention is paid to giving a little fire-heat to prevent the temperature from falling at anytime below 55°. All shoots tied after this time should be laid in as equally as possible, so as to shade and keep the interior of the house cool throughout the summer. Quick-growing leading shoots should not be allowed to inter-twine amongst the wires, as they are generally inclined to do; but should be kept constantly tied into proper position. It is a good plan to take the points out of the leading shoots when the young growth is about 4 feet long; this strengthens the part which has to be retained, instead of the extreme point which will ultimately be cut off. The shoot should not be kept continually pinched at this part, but should be allowed to proceed to the top when the new growth appears willing to go that length. Until growing Vines are finally pinched, they must be gone over at least once a week. No shoot must be permitted to grow unmolested to 3 or 4 feet, and then have the half of that length pinched or cut away. Vines in the earliest houses should be well syringed every day, so as to prevent red spider from lurking about, ready to break out whenever this operation is discontinued. Syringe the small rods of newly-planted Vines every morning and evening. Those planted outside should have their roots protected with boards, or some other covering, if excessive wet prevails.

Pines.—All Queens should be started into fruit by this time; therefore, see that the bottom-heat does not decrease or vary in any way. It is sometimes suitable to turn the bottom-heat on one night and off another. A long thermometer for indicating bottom-heat should be in every bed, as no accurate account of it can be kept by means of sticks. Plants of all sizes, potted a week or two ago, will soon require to be watered at the root. Nothing less than what will moisten the entire ball will be sufficient; and, where the soil is dry, it takes the water a considerable time to work its way into it. Lately-potted suckers must not be watered until it is ascertained if the fresh roots have reached the sides of the pot; and, unless this is the case, it is best to delay watering until they are to be found there.—J. MUIR.

Kitchen Garden.

Sea Kale.—The thongs or pieces of roots that were trimmed off the large roots of Sea Kale, when they were taken up for forcing, and that have since been covered somewhere with soil to keep them fresh, may now be cut into pieces from 4 to 6 inches long, and planted in well prepared ground, in rows, from 15 to 18 inches apart, and from

6 to 9 inches asunder in the rows, keeping, of course, the thick ends uppermost, and just covering them with soil. Another way of treating them is to lay them in thickly in light rich soil, in a sheltered place, until signs of growth appear, when they should be taken up, all weak growths rubbed off, or, at least, thinned, and planted in rows, as has just been recommended. In wet, heavy soils this is the best plan to adopt, as the plants get a better start, and become fuller and earlier developed. In deep sandy loams, or, in fact, on any soil in good condition, fine strong Sea Kale, suitable for forcing, may be raised in one year, from seed sown now in well-prepared land, in drills, 15 inches apart, and 2 inches deep. As soon as the plants appear dust them freely and frequently with soot or lime, and thin them out finally to 6 or 9 inches apart. A dressing of salt about June will have a stimulating effect upon their growth, and all the further care required will be to keep the surface of the ground loose with the hoe. I know that an idea prevails that when seedling roots are forced they are more liable to run to flower than plants raised from root cuttings; this does not, however, accord with my experience. Where Sea Kale is forced in the open ground, without removal, under pots and manure, if new beds are required, they may be planted or sown any time between this and the first week in April. The beds may be made 4 feet wide, with 18-inch alleys between them, and the plants may be planted in groups of three in a patch, and the groups should be 2 feet apart each way; thus, a 4-foot bed will carry two rows of pots when forcing begins. If the soil is at all heavy, everything available in the shape of burnt earth, sand, road-scrapings, &c., should be forked in to lighten it. If seeds are used to form the plantation, they should also be sown in patches 2 feet apart, and thinned out finally to three plants in a patch—of course leaving them close enough together, so that they will be easily covered by the pots used for forcing. If a frame that has been used for early Potatoes, or any other early crop, that has been removed, can be spared, plant it now with French Beans, in rows 18 inches apart, setting the Beans 4 inches asunder in the rows; one of the small dwarf-growing kinds is best for this purpose. If there is not a frame vacant now, but will be shortly, the Beans may be sown in a box, and transplanted afterwards. French Beans, in forcing-houses, will now require a good deal of care to keep them free from red spider; the moment it makes its appearance the plants should be discarded, as the produce after that will not pay for the risk incurred. This is a good time to plant a good breadth of Green Windsor Beans, as the later crops, although useful, are usually not so prolific, and are more liable to the attacks of insects. Early Potatoes on warm borders, now coming through, will require unremitting attention in taking off the covers every fine day, and covering again at night. The nights, for the next two months, will be uncertain as to their temperature. A mild day may be succeeded by a frosty night; therefore, it is best to cover up, even on mild evenings. Late Turnips that are now showing signs of growth should be taken up, have their tops cut off, and the roots placed in a cool dry cellar or north shed; in such a position they will keep good for some time. If not already done, all Parsnips left in the ground should be taken up, and the ground manured and trenched for the next crop.—E. HOBDAV, *Ramsey Abbey.*

THE FUTURE OF THE ROYAL HORTICULTURAL SOCIETY.

ONE word in answer to "A. B." (see p. 231). My first letter in THE GARDEN, dated 21st October, 1873, says:—"Consider what a vast number of well-to-do people, fond of their gardens, there are now in the country. Very many of them would now be willing to help horticulture, if it did not cost them much money or trouble. I would make the annual subscription a guinea." As I wrote then I think now. So much for trusting to the guineas from gardeners; though I hope we shall have the best of their class as Fellows. I well know of the excellent Horticultural Society in Manchester, but the central society does work which no district society can do; so our claims do not in any way clash. The main grounds on which we can claim general support are that fruits, flowers, and vegetables, come from all parts of the country to Chiswick and South Kensington, are judged, and the verdicts circulated all over the country the same week, excellently reported by the horticultural press; and thus are the property of town and country alike. Having long served on the council of the Society of Arts, where the importance of friendly relations with societies having kindred objects, all over the country, was fully understood and carried out, I look forward to the time when the same may be said of the Royal Horticultural Society. I thought Manchester was a good place to seek guinea Fellows, because there clear heads and ample means are to be found. We have some excellent names of would-be guinea Fellows from the Manchester district, and expect more. I have no right to object to the expression

"pet crotchet," because every strong belief becomes more or less a crotchet; but if eight years on the council, and service in so many offices in the Society, do not give means of forming a correct judgment, nothing will.

GEORGE F. WILSON.

Heatherbank, Weybridge Heath.

SUNKEN BOILERS.

In reply to Mr. Dunbar (see p. 232), I wish to state that our raised boiler is now working a range of lean-to houses, 270 feet long, divided into seven compartments. There are pits supplied with bottom-heat in two of the compartments, and there is also a flow and return pipe through a Mushroom-house at the back. Although there is not much variation in the level of the houses (about a foot) there is a considerable deviation in the level of the pipes, including many sudden dips under doorways, &c., and in one case, to reach a house at the end of the range, the flow descends and passes outside in a brick drain under the north wall for 40 feet, before it reaches and ascends into the house. Of course, I do not say a stoke-hole cannot be made watertight with cement; under certain conditions I am aware that it can, but those conditions cannot always be secured. In our case, after incurring a very large expense, it ended in failure; in fact, the year before the boiler was raised, from December to March, there was more than a foot of water in the stoke-hole constantly, and when pumped out it rose again to the same level in less than an hour. Only those who have experienced it can form an idea of what an intolerable nuisance it is to be swamped in this way. Now, if it can be proved, which I believe it ultimately will be, that deep stokeholes are not a necessity, and that there is no advantage gained by placing the bottom of the boiler much lower than the lowest pipe, a considerable expense will be saved. As regards consumption of fuel, my estimate was based on the boiler's average consumption for a series of years; and I am convinced the case is not overstated. One of the places I had in my mind, when I wrote the paragraph at p. 188, and the nearest to London, was the Huntingdon Nurseries of Messrs Wood and Ingram. Their largest boiler was raised, about two years ago, so that the top of the boiler (a large tubular one) is 6 feet above the flow-pipes; and it is now heating, in a most efficient and economical manner, a considerable number of houses in several blocks or ranges. In a letter from that firm that I now have before me, they state that they never had such heating power before. These are facts that cannot be contraverted. I may say, however, that the apparatuses, both here and at the Huntingdon Nurseries, were supplied by, and the alteration carried out under the superintendence of, one of the oldest firms of hot-water engineers in the country. E. HOBDAV.

Ramsey Abbey.

The Hydra Registering Thermometer.—Under the title of "The Hydra," Messrs. Smith and Beck, of Cornhill, have produced an exceedingly good thermometer for registering the highest and lowest temperatures occurring between the hours of observation. It is a considerable improvement on the old form, inasmuch as the bulb, being divided into three heads (hence the name), has a much greater surface exposed to the air, and the instrument is more rapidly affected by changes of temperature—the fault of the old form being its sluggishness. The Hydra is manufactured with the greatest accuracy, the indications of the two columns being identical at all temperatures at which we have tested it. It is hardly requisite to say that a registering thermometer should be hung out of the direct rays of the sun, and that the registers should be set at the same hour each day, when the highest and lowest temperatures of the previous twenty-four hours may be noted. As a good working instrument at a moderate price, we can strongly recommend the Hydra.

OBITUARY.

MR. HENRY HIND.

This gent man who was devoted to horticulture, was recently murdered at Naples. The details of his death are given in the daily papers, and need not be reported here. I was introduced to him last spring at Naples, by Mr. Leigh, of Barham Court, as one conversant with the gardens at Naples, and spent some time in them with him. One more inoffensive, by nature or by his avocation, never met death at the hands of an assassin. There is reason to believe that Mr. Hind was murdered by order of the Secret Society of Market Gardeners in Naples. His skill in the cultivation of flowers had enabled him to undersell other florists, and a deputation from that society had, shortly before his death, waited upon him and demanded that he should raise his prices, which he had refused to do. Unfortunately, the fact that Mr. Hind's accession to fortune would remove him out of their way was unknown to the conspirators. W. R.

NOTES AND QUESTIONS—VARIOUS.

Cupressus Leeana.—A fine pyramidal plant of this Cypress, growing in the Feltham Nursery, is producing cones for the first time. This variety was raised many years ago, by Messrs. Lee, at the Hammersmith Nursery; and has always been, until now, considered to be a male Cypress.—A. D.

Lime Poison to Rhododendrons.—As a lover of Rhododendrons I beg to say one word in their behalf. Professor Owen in his article on "Lilium giganteum," tells us that when making a bed for Rhododendrons he put some lime with the bog-earth and loam used for that purpose. Surely he must have known that lime is most injurious to these plants, in fact, poison to them.—T. B.

Conifers at Keir, near the Bridge of Allan.—I observed in Sir William Stirling Maxwell's pleasure grounds, the other day, some very fine Conifers, and amongst them a female *Araucaria imbricata*, quite 45 feet in height, branched from one foot above the ground, at regular intervals apart to the top. When seen from a distance this tree has the appearance of a gigantic cone.—WILLIAM LAURIE, *Lynnwood, Alva, Stirlingshire.*

Laurus latifolia.—Why is this fine Laurel not more abundantly grown? It is quite as hardy as the common kind, quite as robust and free, and its noble leaves—almost as large and glossy as those of a *Magnolia*—render it much more ornamental. Large masses of this fine Laurel, growing as the common Laurel is now seen, would be extremely ornamental. It is certainly a shrub to which the attention of planters should be directed.—D.

Geraniums for Forcing.—To all who have great demands made upon them for cut flowers at all times of the year, but particularly at this early season, I would like to say that three of Mr. Pearson's Geraniums are first-rate for forcing purposes, viz., Mrs. Hetley, E. J. Lowe, and Colonel Holden, the last being this year the best of the three. Usually, E. J. Lowe is the best, but this year even the Colonel beats that kind by a long way.—N. H. P.

Agrostis nebulosa and Briza maxima.—These Grasses, grown in pots, are valuable for intermixing with flowering plants in greenhouses and where stands of plants have to be kept in rooms; or where the decoration of fireplaces forms part of a gardener's duty they are of greater service still. Seeds of these should be sown now, at latest, in 48 or 32-sized pots, and grown in a cool structure. Other ornamental Grasses may also be sown, but these are superior for the purposes just named to any others.—R. P. B.

Oncidium Weltonii.—A specimen of this, with twenty flowers on a spike, is said (see p. 232) to be the finest yet produced. Allow me to state that I have had plants of this *Oncid.*, and have shown them at Manchester and elsewhere, with two spikes on one bulb—one with forty-six blooms on one spike and one with forty, eighty-six flowers in all—in perfect freshness and beauty. A plant, which I exhibited at Leeds last June, produced three spikes from one bulb, and had over seventy flowers expanded at one time.—E. MITCHELL, *Broughton, near Manchester.*

The Purple Fruited Guava (Psidium Cattleianum).—This is a most desirable addition to the dessert during the summer and autumn months, and this variety of Guava being very easily managed, should be more extensively cultivated than it is. Plants of it, when grown from seed, commence bearing at three or four years old, and they do well in Vineries or other houses, not started too early. A house, from which frost is excluded, is all that is required in winter, and under favourable conditions of growth, fruit is produced abundantly; it is extremely palatable for dessert, and makes a delicious preserve.—W. COX.

Planting Vines after Growth has Commenced.—I had five Vineries to plant last spring, and I had all the eyes on the rods "broken" on purpose about half-an-inch previous to planting. The roots were well shaken out of the soil in which they were growing, and planted carefully in the fresh soil. They were then watered with tepid water, and, singular to say, they received no check whatever, but, on the contrary, grew away strongly. I may add that they were pruned back early in winter to within 3 feet of the pot, an operation which caused them to plump up their buds without bleeding, previously to starting into growth, which they were allowed to do quietly, and they soon reached the top of the house, which they filled with dark leathery green leaves that have hitherto resisted red spider.—J. MILLER, *The Gardens, Clumber.*

Fruit for Table Decoration.—I notice (see p. 225) a useful article on this subject; but it relates wholly to flowers, while for the decoration of a breakfast table I know of nothing so good as a first-class pot of Strawberries covered with fresh Moss, and having the fruit skilfully tied out, inviting, as it were, the guests to help themselves; for it is a well known fact that a single fruit gathered by oneself is worth a whole handful gathered by others. I have also used for large dinner parties—say forty guests—pot Vines growing in 16-sized pots, each bearing half a dozen bunches of Grapes, as noticed in THE GARDEN some months back. By way of change, too, a black Jamaica Pine, shaken out when the fruit is ripe and re-potted in a small pot, placed in the centre of the table with pot Vines at each end has a fine appearance.—R. GILBERT, *The Gardens, Burghley.*

Growing American Cranberries.—In answer to your correspondent, E. W. Cook (p. 222), I may say that, so far as my experience goes, these do best on a level surface, where the beds can be occasionally flooded or irrigated, in the same manner as are water meadows. Still, I think he would be successful in their culture on the ground, and in the situation, he describes. I would, therefore, advise him to form beds 4 feet wide, and divert the overflow from the pools by a row of 2½-inch drain-pipes to each bed. They will only grow in peat or bog earth; and this should be of the poorest description. If it be what is considered "good" peat, add a large quantity of pure sand, which will cause the plants to be much more fruitful than if grown in peat only. There should be two rows of plants in each bed, and the plants should be 18 inches one from the other. In Sussex, there would not be any danger of injury from spring frosts when they are in flower.—W. WILDSMITH, *Heckfield.*

Watercresses without Water.—When last autumn I dressed a bed of soil in the greenhouse with some sifted dredgings from a ditch before planting out Pansies on it for the winter, I soon found, amongst other aquatic plants that sprang up, a small one of Watercress. This is now a good-sized plant, and would yield a capital picking of side-shoots. I simply kept it well watered, and it grew continuously, but, as the house was a cool one, I have concluded that the cress wanted a little heat. To reserve beds specially for Cresses would scarcely be necessary in any large place, where there is plenty of room at disposal in Vineries and other warm houses. What should be done is, to get a quantity of rooted shoots of the Cress pricked out into shallow boxes late in autumn, to keep them in a cold frame, and to bring them into heat as wanted. If kept freely watered, there can be no doubt that these cresses would grow rapidly, and many a nice gathering might be obtained from them during the winter months.—A. D.

"This is an art:

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

A GOOD AND DURABLE LABEL.

ANYONE who has a large collection of plants—be they Roses, Conifers, or herbaceous subjects—must be impressed with the necessity for a good system of labelling. Especially is a good system required for herbaceous plants and bulbs, which disappear annually altogether; and so run the same risk, if their place be not clearly and permanently ticketed "engaged," as first-class passengers in an excursion train—viz., of having third-class passengers thrust in on the top of them. Three things are necessary in a thoroughly good label—durability, legibility, and unobtrusiveness; and to these most people will be inclined to add a fourth—cheapness. They must be durable in the sense not only of lasting long, but of keeping the inscription long; they must be legible, not, as in some public parks and botanic gardens, in the sense of an



Fig. 1.

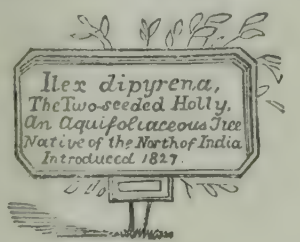


Fig. 1.

advertisement, but legible as a reference when information is really wanted; nobody, at least in a private garden, wants the names of plants "shouted" at him by labels of the type in figs. 1; and they must, as I have said, be unobtrusive, for nothing looks more pedantic or unsightly than quantities of white labels all over a bed. I have been fortunate enough to hit upon what I believe to be the one of all the many kinds of labels which are offered to the public that best combines all these qualities; and it may also be used with equal advantage for Roses, Conifers, fruit trees, in short, for anything which requires a label. It is the ordinary trefoil-shaped zinc label attached to a piece of galvanised iron wire as thick as a goose-

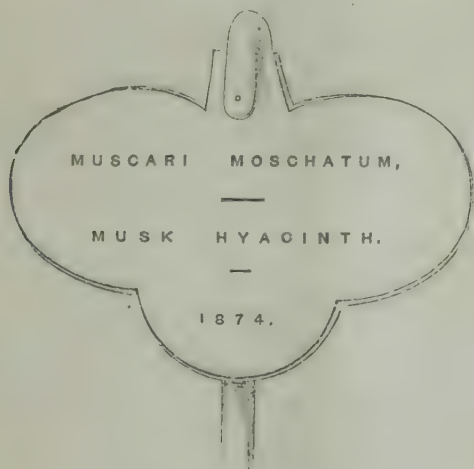


Fig. 2. (Two-thirds natural size.)

quill. The mode of attachment is shown in fig. 2. The end of the wire is bent to an acute angle, and is then hammered over the hole in the label. The wire should not be too thin, as it is then apt to bend over in the ground; nor too thick, as it is then difficult to beat it over the label. With the thickness named, the process is easy and rapid, after the wire has been cut into lengths of 1 foot or 14 inches with a cold chisel; the face of the label is then cleaned with sand-paper, and the name of the plant written with the usual zinc-label ink. The cold grey colour of the zinc is very unobtrusive in a border, and the presence of several dozen of these labels is no eyesore, as they may be thrust in to within 2 or 3 inches of the ground. They remain perfectly legible for years. Some here, put out in 1867 (eight years ago), are nearly as legible

now as then. The same label may, if necessary, be used over and over again, for if the old inscription be rubbed off with sand-paper, a fresh surface is presented. Another advantage of this kind of label is, that it may be used on rock-work without any damaging effect. The wire may be thrust between the stones till the label rests close to the ground, and it is legible without being pulled out. Many a plant is lost for the want of durable labels put in at the time of planting, and these appear to answer every purpose. SALMONICERS.

CULTURE OF BOUVARDIAS.

BOUVARDIAS have been long known in this country; but, until recently, they have not met with that attention which their merits demand. Of late years, a system of cultivation more in accordance with their natural requirements, and the introduction of varieties greatly in advance of older sorts, have done much to place them in the foremost rank amongst winter-flowering plants. From this, it must not, however, be inferred that they are exclusively winter and spring flowers; for, if the plants are well managed, and grown in sufficient quantities to furnish a succession, they may be had in bloom continuously. Few plants, indeed, have so many desirable properties as Bouvardias; and their comparatively small size—from 1 foot to 18 inches through—renders them suitable for even the smallest collection. Not only are they strikingly beautiful subjects for the warm conservatory when in flower during winter, but their blossoms are well adapted for cutting—colour, form, and their delicious fragrance, combining to make them especially suited for bouquets and coat flowers, as well as for intermixing with other blooms for decorative purposes in the many ways in which flowers are now used. The continuous habit of flowering possessed by Bouvardias is another point in their favour. When well grown, and in a genial atmosphere, the same plants will keep on blooming for three or four months at a time—a consideration of importance, as where such is the case fewer plants are required to be grown. As regards cultivation, young plants are much to be preferred to old ones for several reasons; they flower and make growth more freely; they are less straggling in habit, and the blossoms are larger than those on old plants. It is, therefore, better to strike fresh plants every season, and to discard such as have bloomed. Cuttings from them should be struck in spring in a brisk heat, and, when well rooted, they should be grown on freely, either in pots or planted out, and in September are transferred to the pots in which they are intended to flower; but, in whichever way they are grown, they require very rich soil, consisting of two parts of well decomposed rotten dung and leaf mould, and three parts of good loam, with a little sand. After being struck they should be planted out in a good light pit in a genial growing temperature through the summer, and sufficient water should be given at the roots, and in syringing overhead, to supply their requirements in that way, and to keep them clean and healthy; they must also have air in sufficient quantity to induce sturdy growth. Plants that are turned out into pits will, as in the case of almost anything else that will succeed under such treatment, be found to make stronger growth than such as are confined in pots. Planting out is also a great saving in the matter of labour in watering, where they are grown in large quantities; but, when transferred to pots, that operation must be conducted with care, taking them up with their roots as perfect as possible, and potting them in soil similar to that just described. They must afterwards be kept in a close warm moist atmosphere, until they get fairly established, and are in an active growing state. It must then be determined what portion of the stock is to be brought on for early winter flowering, and what is to be kept for later use and for spring. The latter will require to be kept in an intermediate temperature, and just moving a little through the early part of the winter. Bouvardias do not succeed well in the temperature of an ordinary greenhouse at this season. Such as are required for flowering in December, and in the beginning of the year, must be kept in a brisk heat night and day all through November, and onwards, and they should be raised near the glass; 70° at night is a good temperature. So treated, they will

keep on flowering for months, and every bit of growth which they make will throw up bloom. Bouvardias strike readily from root-cuttings an inch long, put in pots of sand in a brisk bottom-heat; and, when they have pushed shoots an inch or two in length, they should be potted off singly, and kept on growing. *B. Humboldtii corymbiflora* is one of the best varieties in cultivation. The tubes of its flowers measure 3 inches in length, and the lobes of the limb $1\frac{1}{2}$ inches across; these are pure white, produced in bunches of a dozen each, and are highly perfumed. Another white and very beautiful dwarf kind is *B. jasminoides*, a free-growing sort, and a profuse flowerer. *B. Vreelandii* is another dwarf, and extremely free-flowering kind, which is continually in bloom—a beautiful white flower, with a faint blush tinge on the outside. Another variety, called Maiden Blush, has bright blush-pink blossoms, and is a very distinct and desirable variety. *B. Hogarthii* is scarlet; it has a good habit of growth, and produces fine trusses of flowers. *B. elegans* is said to be a sport from *Hogarthii*; its flowers are of a scarlet-tinged carmine, and very beautiful. These are all kinds that may be relied upon; they are, indeed, the best in cultivation, and, whether one or all of them be grown they will give equal satisfaction. At the same time, it may be as well to say that, for general usefulness, the white varieties are the best.

T. B.

DISROOTING CAMELLIAS.

I CAN understand Mr. Gadd's experimenting in disrooting his Camellias; but I cannot understand his advising such a proceeding in ordinary practice. Their succeeding, after such treatment, is simply one more proof of the tenacity of plant life, and its recuperative powers after vigorous root-pruning. If "N. H. P." followed this advice in planting his Camellias out, I fear he will have but little trouble in gathering the flowers which they may produce for some time to come. In planting out Camellias at this season, just before they commence growth, and when all their feeding roots are growing, not a fibre should be disturbed on the outside of the ball, where the principal active roots are. I would not even disturb the crocks, but would make the holes 18 inches wider than the ball of each plant, and 3 or 4 inches deeper; then place each plant in its proper position, and, with a stout rammer, make the soil surrounding, for 9 inches, as solid as the ball itself, leaving the new soil a little higher all round than the ball, and keeping it so until the plants have got fairly established; this is to prevent the water passing down the new soil, and leaving the roots dry. To still further assist the percolation of the water through the old ball, a good plan is to take a stout round iron skewer, and pierce it downwards right to the bottom, in a score of places; plants so treated, if the border in which they are planted has been well made, and they are properly attended to in other respects, will grow very rapidly. When planting out is done in the autumn, when the roots are quite at rest, a portion of the old soil may be taken away, and the roots a little opened out; but any interference with them at this season will stop the coming summer's growth more or less.

T. BAINES.

Spiræa palmata not a New Plant.—I have recently had a discussion with a mutual friend of yours and mine, who insists that this so-called new plant, sent out by some of your nurserymen three or four years ago, must have been then new, or it would never have been endorsed by so many respectable firms, editors of horticultural journals, and professional botanists of repute. But now for a few facts: Thirty years ago I was an apprentice at Melville Castle, where one of the largest private collections of herbaceous plants in Scotland was grown at that time. I was then fairly well up in nomenclature, and well remember that we grew in abundance plants known as *Spiræa palmata*, besides a full collection of other species of that genus. When the "new" *Spiræa palmata* was offered at half-a-guinea a plant, I became a doubting purchaser, and doubted still more as I became impressed with the idea that the appearance of the plant was familiar to me as an old acquaintance of thirty years ago; when it flowered the identification became complete, for the *Spiræa palmata* of the Melville collection of 1840 was the same as my imported London "novelty" of 1870. To make assurance certain, a friend, also a graduate of Melville, sent me last summer a plant of *Spiræa palmata* that had originally come from the Melville district, but which he had grown for over a dozen years in America, which proved to be identical in every respect with my "new" *Spiræa palmata*.—PETER HENDERSON, 35, Cortland Street, New York.

NOTES OF THE WEEK.

— AT this season, when good dessert Apples are scarce, it may be well to note that the best-flavoured and most juicy Apple now in Covent Garden is the Old Nonpareil.

— AMONGST hardy herbaceous plants suitable for forcing, few are more effective than the *Spiræa Aruncus*. The elegant feather-like plumes of this Meadow-sweet have been brought into Covent Garden Market during the past week.

— SIR ARTHUR GORDON, the new Governor of Fiji, has, in reply to a requisition signed by the Horticultural Society, promised to assist the Society in regard to the importation of plants which are indigenous to the islands just acquired by Great Britain.

— THE eighth edition of Mr. William Thomson's "Book on the Vine" is, we understand, in the press, and will shortly be published in an enlarged and revised form.

— THE case of "The King of Portugal v. Carruthers and others," relating to the possession of the Welwitsch Herbarium, which was partly heard last Monday, has been postponed till next term, on the suggestion of the Vice-Chancellor, that the matter might be settled out of court.

— MR. MEREDITH'S Vineyard at Garston has been purchased by the Cowan Lime Heating Company, who have determined, not only to make use of it as an exhibition ground for their patent heating apparatus, but also as an establishment in which Grapes will be grown as well, if possible, as they were by Mr. Meredith.

— WE are requested to announce that the Committee of the new Horticultural Club have nearly concluded an arrangement by which they will obtain the accommodation of a club-house, within three minutes' walk of Charing Cross, and overlooking the Thames Embankment. There will be a reading room, dining, drawing, billiard, and smoking rooms, and all the adjuncts of a West End club; while for country members bedrooms will be provided.

— A PLANT of the Scarlet Tree Rhododendron (*R. arboreum*) is now blooming freely in one of the villa gardens facing the Richmond Road at Kew. In warm situations in the southern counties, this Rhododendron might be tried out of doors, and in Devon and Cornwall it would certainly succeed; but, in most parts of England, its proper place is under glass—a position which it well deserves. It flowers early; and, when out of doors, the blossoms are injured by frost.

— REFERRING to what was stated (see p. 245) respecting the Seville Long-pod Bean, allow me to say that in Spain and the South of France it commonly grows 3 feet in height, even more, but in the open ground in England its average growth will probably seldom be over 2 feet. The leaves are often gnawed by insects infesting their undersides. The seed is paler and brighter than that of the common Long-pod Bean, and is not of a handsome yellow colour.—D. GUILLENEUF.

— MONSIEUR A. TRUFFAUT, of Versailles, contributes a paper this week (see p. 257) on a remarkably successful mode of striking cuttings, in use in his own garden at Versailles. By this method we have seen strong plants of *Dracænas*, &c., established in four weeks from the time when the cuttings were taken off; and to see the quantity of cuttings of tropical plants that are struck by simply placing them, according to his plan, on the saw-dust, is most interesting.

— MR. ELLACOMBE, of Clyst St. George Rectory, Topsham, Devon, father of Mr. Ellacombe, of Bitton, and one of the oldest and most extensive cultivators of hardy flowers and herbaceous plants in this country, has sent us specimens of the brilliant *Anemone fulgens*, together with various other South European kinds. Mr. Ellacombe states that these *Anemones* and the blue *A. apennina* succeed well with him at Topsham, but that there the common Red *Hepatica* entirely fails.

— ONE of the chief products of Auckland, New Zealand, is Kauri gum, the semi-fossil resin of *Dammara australis*. This resin is found at a depth of from 2 to 3 feet from the surface over a large area of land once covered by Kauri forests, but now barren and almost unfit for cultivation. In these waste lands there is no restriction enforced by Government as to the right of digging for the resin, and it is calculated that in various parts of Auckland as many as 2,000 men have found employment at one time digging up the Kauri resin. This number, however, is now considerably reduced, owing to the demand for labour in other directions; nevertheless, large quantities of the resin are required by varnish-makers in this country, and consequently many persons still find employment in digging it. The Maoris bring a considerable quantity to market. The best quality fetches in the market at Auckland from £30 to £33 per ton. At this price the gum-diggers are able to earn from £1 10s. to £4 per week; the average earnings, however, are about £2 per week. In the three years from 1870 to 1872, there were exported from Auckland 14,276 tons of Kauri resin, valued at £497,199.

THE FLOWER GARDEN.

SWEET PEAS.

I HAVE often observed, when these were grown for several seasons in succession on the same piece of ground, that they gradually dwindled and became weaker in growth. Change and rotation are, therefore, beneficial to them; and, in most places, this can easily be given them. One of the most common varieties is the scarlet Invincible, the blooms of which are all of one colour, and extremely showy; this kind is often grown by itself, but I prefer to see varieties possessing other colours mingled with it, such as sorts that produce white, purple, lilac, bluish, and black blossoms, and when all are equally mixed in a single row they look exceedingly well. Where the borders along the edges of the walks in the kitchen garden are planted with flowers in summer, it is always desirable that some kind of floral screen should divide the flower from the vegetable quarters, and for this purpose Sweet Peas are very valuable. In moderately rich soil they grow 6 feet high, and flower from the ground to the extreme points. In many instances they bloom so profusely that nothing but blossom is visible, and their long stems and exquisite odour render them great favourites for bouquet making, a purpose for which a very short row will supply a profusion of flowers from July until the end of September. I have seen the seed sown in pots and brought on under the protection of a frame from about the beginning of April until the middle of May, when the young plants were planted out in rows early in the season, like ordinary Peas. This plan has the effect of bringing them into bloom a few weeks sooner than those sown in the open ground at the same time, but I do not think that those started in pots remain so long in bloom as those sown in the position which they are intended permanently to occupy; I prefer, therefore, the latter treatment. The seed should be sown in 3-inch deep drills, not later than the beginning of April. The ground should previously be well manured with rotten dung, and, as I before stated, a change—although it should only be a foot from where they grew last year—is very advantageous to them. When the weather is backward about the time they appear above ground, the rods should be put in, and thus ward off cutting winds. I always like to see Sweet Peas staked with clean Beech rods, and not with rough-looking Spruce or Larch branches, which are not in keeping with the flowers during the summer. When the weather is exceedingly dry, liberal waterings of liquid manure helps greatly to sustain their vigour. Every one may save his own seed by allowing a few of the first opened flowers to form pods, but the last blooms must not be depended on, as the frost generally nips the capsules before the seed is matured. After the seed has lain for a week or two, as it

was gathered to dry, it may be cleaned and stored in a paper bag in a dry room until it is wanted the following season. It is singular that Sweet Peas are not oftener cultivated in pots for greenhouse and conservatory decoration than we generally find them; they do as well, and are quite as ornamental in pots as elsewhere, and for mixing with other greenhouse subjects have an effect that is entirely their own. When it is intended to grow them thus they should be sown in 3-inch pots like those for planting out, and when they are ready they should be shifted into 7 or 8-inch pots, with a good quantity of manure about their roots to give them support; a deep cool frame, with the sashes removed, is a suitable place in which to

grow them after they have been finally shifted. As soon as the growth becomes too long to support itself, or shortly before such a length is reached, five or six Birch twigs, from 3 to 4 feet long, should be put in as stakes to keep them up; no tying, or anything of the kind is needed, as they twine round and hold on by the twigs. All they require, from the time when the stakes are put in until they are ready to adorn the conservatory, is close attention in the way of giving water. All the perennial or Everlasting Peas, as they are often called, are well worth growing extensively in herbaceous borders. *Lathyrus latifolius albus* is the common white variety, and *L. latifolius roseus*, *L. grandiflorus splendens*, and *L. rotundifolius* are all showy kinds, which associate well with the annual sorts. Their blooms are larger than those I have previously described, not so sweetly scented, but equally suitable and useful for bouquet making. The whole may be raised from seed sown about this time, and a patch of them here and there amongst herbaceous plants has a fine appearance. They do not always bloom the first season after being sown, but strong roots are formed during that time, which ensure a profusion of flowers the following year. They require staking throughout the summer, and the straw should be cut away level with the ground when it decays in autumn.

J. MUIR.



Triteleia uniflora.

TRITELEIA
UNIFLORA.

CONCERNING this pretty spring-flowering bulbous plant, of which the accompanying is an illustration, we have little to add to what

has already been stated in our columns respecting it. Its flowers, which are white, delicately flushed with blue, and marked through the middle of the divisions outside with a violet streak, are, individually, extremely pretty, but to be thoroughly effective they must be seen in the form of good-sized clumps. Of *T. uniflora* at least two varieties are in cultivation, one of which (*T. u. conspicua*) has larger flowers than those of the species, and the other (*T. u. lilacina*) has flowers of a pretty lilac colour. These, as well as the species, make desirable plants for rock-work, or for other conspicuous positions in the flower garden. They will succeed in any kind of soil; but, being natives of the sandy plains of Mendoza, that of a light character

suits them best. In mild winters established clumps of these *Triteleias* will bloom more or less from November till June, and when grown in pots under glass their flowers have such a cheerful and pleasing appearance during the winter and spring months as to render them well worth attention for that purpose.

The Friar's Cowl (*Arum Arisarum*).—This curious little *Arum* was flowering in the utmost profusion, in the Riviera, during the month of January, and its distribution would seem to be general. I found it mostly growing on the stages under the Olive-trees. It is a conspicuous plant. The spathe, which is hooded (and hence its name Friar's Cowl) is of a dull purplish-white, with darker longitudinal stripes, the stem that supports it being spotted, as in the Dragon *Arum*. The spadix, which is very slender, is incurved, and it thus adapts itself to the hooded spathe. It has no cirriform glands. The leaves are sagittate, with the lobes obtuse at the base. It has something of the carrion smell of the *Dracunculus*. *Arum italicum*, with its fine leaves most frequently veined with yellow, that are conspicuous throughout the winter, was also very abundant; but, as it does not flower till April, I had not an opportunity of seeing it. It is described by Reichenbach as having the spathe externally of a reddish-green, and white internally. The spadix is yellow. These two species I noticed commonly in the Riviera.—PETER INCHBALD, *Hovingham Lodge, York*.

Crocus Imperati.—I am glad to see this beautiful early-flowering species brought into notice, as it is undoubtedly one of the most delicately beautiful of all spring flowers, and a fit associate for the earlier *Narcissi*, *Iris stylosa*, *Iris* (*Xiphion*) *Histrio*, the dusky *Iris longifolia*, and hardy *Cyclamens*. I first became acquainted with this species from seeing a figure of it in Sweet's "Flower Garden," Vol. I., table 98, but I never saw living plants of it until this year, when I met with it in Mr. Barr's grounds at Tooting, forming a bed 3 or 4 feet square, in full bloom, in January, where it withstood wind, frost, and rain with impunity, notwithstanding the delicate texture of its flowers. Mr. Parker also, about the same time, kindly sent me cut blooms of a variety of it, in which the petals were nearly purple, and the sepals very faint lilac. Sweet, in his description, says, "flower without scent," but all the blossoms of which I have seen have been delicately perfumed. I must say a word about Crocuses in the form of cut flowers, for which purpose they should be plucked as soon as the buds are fully formed and before they expand. A little tact is necessary in arranging them to advantage, and for this purpose nothing is better than a flat glass dish fitted with wet sand. Care must be taken to insert the buds far enough apart among the Ferns or other foliage with which they are associated, so as to give them plenty of room to open, which they soon do when removed into a gas-lighted or heated apartment, and it is difficult to imagine anything more bright and beautiful than these flowers are when seen under artificial light and intermixed with plenty of fresh foliage.—B.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

A good Tea Rose for Market Purposes.—I was told the other day that from one dark apricot-coloured Tea Rose *Madame Falcot*, worked on a standard Briar stock, out of doors, Roses had been cut every year, to the value of between 30s. or 40s. a year. It is evident, therefore, that this is a useful Rose for furnishing cut bloom for market.—F. S.

Primula cortusoides as an Edging Plant.—Have any of your readers tried the old *Primula cortusoides* (not *cortusoides amœna*) as an edging for spring borders? We have a bed of it raised from seed. The leaves are very beautiful, and the recent night-frosts have not affected them.—GEORGE F. WILSON, *Heatherbank, Weybridge Heath*.

Cineraria maritima compacta.—This is a beautiful form of *maritima* with very elegant silvery foliage. It is dwarf in habit, which renders it particularly useful for combining or contrasting with dark-leaved plants. Undoubtedly when this plant becomes better known it will be extensively used for purposes of decoration. It possesses a hardy constitution, and has a light and cheerful appearance.—G. WESTLAND, *Witley Court*.

Sowing Hollyhock Seed.—This may be sown in pans now, and placed in a frame with a gentle heat. When the seedlings appear remove them to a cold frame, keeping them near the glass and well aired. When the plants have two rough leaves they may be planted out in an open situation, in light sandy soil, and in lines 1 foot apart and 6 inches from plant to plant in the line. In October they may be taken up and potted if of a choice strain, and be wintered in a cold frame, planting them out at the end of March.—Q.

Fine Specimens of *Lilium giganteum*.—I read with much interest Professor Owen's letter in *THE GARDEN* for March 6th, but am surprised to find that he considers the growth of his *Lilium giganteum* satisfactory. We have grown this Lily at Thursley, in Surrey, for several years, in ordinary garden soil, keeping it in a cold pit from the frost during the severe winter months; and have considered those that did not exceed 6 or 7 feet in height as failures. Our finest, last year, measured 9 feet 8 inches, from the top of the pot, and bore fifteen blooms, all perfect. Our bulbs came originally from Dangstein, where, I believe, they grow some, most years, wholly in the open ground. The plant, I understand, is a native of Nepal.—E. R., *Kensington*.

THE INDOOR GARDEN.

CULTURE OF THE CINERARIA.

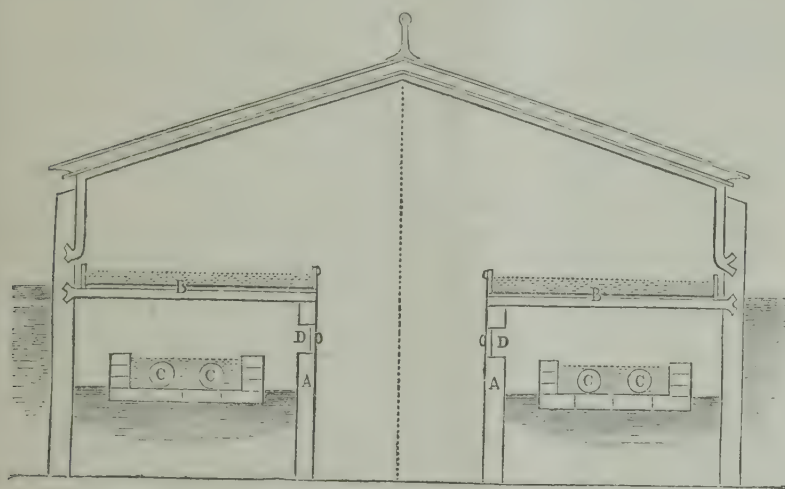
AMONG soft-wooded winter-flowering plants there is none more useful than the *Cineraria*; and, wherever there is a demand for showy plants for conservatory decoration and cut flowers, it is invariably grown in quantity. There are now very superior strains of this flower obtainable from seed, and these render it unnecessary to propagate by cuttings—at one time the only means of securing good varieties, which, when once obtained, may easily be propagated, by annually selecting a few plants with the best flowers, and setting them aside in a house by themselves for seed, while the less select varieties are used for cutting from and for decoration. Their diversity of habit, form, and colour, and the wonderful size of individual flowers, are not surpassed by any other decorative plant, furnishing, as they do, so many shades of blue, purple, red, and white. The *Cineraria* can be grown into large specimens for drawing-room vases, or flowered in small pots for edgings in the conservatory, and it may be had in bloom from November to May. The cool moist months of winter and spring are, however, the most favourable to its growth and continuous flowering; as the sun gains power with the approach of summer, its fine broad trusses of bloom become short-lived, even where enjoying a cool house with shade. A little seed may now, or soon, be sown for the very earliest plants to come in bloom in October; another sowing should be made in May for winter blooming, and the last at the end of June for the latest spring plants. Prepare a pan or box for receiving the seeds by putting in plenty of drainage in the usual way, then filling in the roughest part of the soil within an inch of the rim, and pressing it firm, adding $1\frac{1}{2}$ inch of finely-sifted soil, consisting chiefly of well-rotted leaf mould, and a fourth-part of loam and sand; press the surface quite level and smooth, and sow the seeds over the surface equally, and again press with a board, without covering the seeds at all; place the pans in a moist close pit, where there is a little bottom-heat but no fire-heat, or in a shady part of a greenhouse; or, what is better still for these seeds and many others, in a warm north house; place a sheet of glass over the mouth of the pan until the seed germinates, when it must be removed, to prevent the seedlings drawing, and the pan replaced close to the light, in whatever house it may be. When the seedlings have developed two rough leaves, and can be easily handled, they should be transplanted into boxes, giving them 2 inches of space every way; place the boxes in a cold pit, and shade them from bright sunshine, taking care to keep the soil and atmosphere constantly moist; allow abundant ventilation, but no draft. When the plants begin to be overcrowded in the boxes they should be potted into 4-inch pots, and as the heat of summer increases, they should, at the end of May, be moved into frames, facing north; and, as the plants increase in size, and it is found necessary to pot them on, some into 6-inch and some into 8-inch pots, the frames will require raising on bricks, to ensure plenty of ventilation. Shelter and moisture, however, about the soft foliage, must be still maintained, for if the *Cineraria* be once allowed to become stunted and wiry in its growth, from neglect of water, or any other cause, the prospect of good plants is quite hopeless. Weak manure-water should be given them every time they are watered, after they have filled their pots with roots. The *Cineraria* is not particular as to soil. It will grow well in a fresh sandy loam, with a third part of well-rotted horse manure, or leaf mould, to which should be added a little coarse river sand. In the northern counties, the *Cineraria* may, in summer, be grown in the open air, provided the position be sheltered from drafts, and shaded by a wall or thick hedge. The position having been made moist by copious watering, the whole must be removed, about the end of September, under glass, and kept cool. In the dry, hot southern counties, a frame is, except in very favourable positions, necessary, to protect the plants from the hot winds. The north side of a high wall will, without the shelter of a frame, sometimes be found too dry for them to retain the necessary moisture. The latest sown batch of plants will be found the most easy to manage, and will turn out the best specimens, having the cool and moist dewy nights of autumn in

their favour. The *Cineraria* is particularly subject to the attacks of green-fly, especially in summer, but these vermin are easily destroyed by tobacco smoke. Fly will sometimes attack the roots, without any signs of it on the leaves, in which case the plants should be turned out of their pots, which should be inverted, the plants placed on them, and in this position should be fumigated, and then returned to the pots. Large specimen plants of the *Cineraria* may be grown by shifting the plants on into 10-inch pots, using some rough bones in the soil, but care must be taken that the plants never become in the least pot-bound before they are shifted into the flowering-pots; in other words, they must be kept steadily growing, without check, and when the heads of bloom are well up they may be opened out, and tied into shape by thin ties of bast to the rim of the pots, for which purpose perforated-rimmed pots should be used, as they are much better adapted to this work than the common pot, which necessitates the use of sticks. These specimen plants must be grown close to the glass, in a moist house, from which frost is excluded; weak liquid manure must be given regularly, and plenty of room allowed between the plants for the free circulation of air.

W. D. C.

NEW MODE OF STRIKING CUTTINGS.

THE number of foliage plants annually required in Paris for indoor decoration led us to discover some quick and economical method of propagation, by which we might be enabled to produce, at a small cost, large quantities of plants, principally *Dracænas*, *Ficus*, *Crotons*, *Aralias*, &c. For two years we



Section of M. Truffaut's Propagating-house, Versailles.

have, with the most satisfactory result, adopted the following method, which I believe is little, if at all, known in England. Experience has shown us that in a plant-house, without the aid of either bell-glasses or frames, cuttings will take root well and rapidly when inserted in saw-dust, if they are supplied with a sufficient amount of heat and damp at their base and in the atmosphere. We have, therefore, made, expressly for the purpose, a house, the construction of which will be more readily understood after a glance at the accompanying illustration. It is an iron house, about 30 feet long, and 6 feet 6 inches in height, above the footway. The house is double glazed, in order that the exterior air, which would cool the atmosphere and injure the cuttings, may be excluded. The walls are of brick, and the house is built as deeply as possible in the ground. A foot-path, about 2 feet 6 inches wide, runs down the centre of the house, and on either side of this path two small walls (AA) enclose the soil, and support a table BB, formed of T irons, upon which rest tiles, placed with a small space between them, in order that the water accumulating after watering the slips may be carried off. At intervals in the wall (at D) openings of about 7 inches in length, and about 5 or 6 inches in height are made, which may be closed or opened at will, by means of cast-iron sliding panels, which enables us either to retain or get rid of the hot damp air escaping from the piping which, as will be seen from the sketch (CC), runs through the length of the house, and are enclosed in a reservoir, built of bricks and cement, and filled with water. Upon the top of the table, formed, as we have said, of tiles, is spread a layer of

deal saw-dust, about 6 inches in depth. This kind, and that of Poplar, are the best; but the saw-dust of Oak must never be used, as it is very injurious to the cuttings. Such is the house when, in the middle of December, we commence the propagation of the plants. The house is heated for two or three days, so as to raise the temperature of the saw-dust to about 70°, and the cuttings are then made in the usual way, and inserted side by side to a depth of about an inch or an inch-and-a-quarter. In the case of *Dracænas*, we have no leaves attached, and this is the best way of avoiding rot. The leaves of *Ficus*, *Aralia*, &c., are left on on account of their size. The temperature of the air in the house should always be about 77° Fahrenheit, and that of the layer of sawdust from 87° to 90°. One of the indispensable conditions of success is the constant humidity of the air in the house. We obtain this result in some measure by the evaporation of the water contained in the tank through which the pipes pass, and by saturating with water the path, the walls, and the cuttings, which we soak every day overhead by means of an ordinary garden watering-pot and rose. Under these conditions, the slips of *Dracænas* take from ten to fifteen days to take root; *Ficus*, from fifteen to twenty days; *Crotons*, about eight days. As soon as the roots have attained a length of from $\frac{1}{4}$ to $1\frac{1}{2}$ inches each cutting is potted separately in a pot proportionate to its size, and is then returned to its former position. Eight days afterwards the roots will have nearly filled the pots. The young cutting, which has by this time become solidified, is transferred to a hot frame or to another house where it acquires all the necessary hardiness. We have only spoken above of certain kinds, because it is upon these that we operate to the greatest extent; but the same process of propagation will succeed quite as well in other cases, and more especially with soft-wooded plants. It will easily be perceived that this system has very great advantages, which, so far as a large number of plants are concerned, do away with the necessity for cloches or frames hitherto used. Furthermore, the size for cutting the slips is no longer a matter for consideration. We made cuttings this year of *Dracæna Mooreana* of 3 feet in height; of *D. amabilis*, of 23 inches; of *Ficus*, of 20 inches; of *Aralia pulchra*, 2 feet in diameter. We have struck since the 15th December from six to seven thousand cuttings of *Dracæna terminalis*, *Cooperi*, *Braziliensis*, *rubra*, and of all the novelties; 4,000 cuttings of *Ficus*, half of them being at least a foot in height; and, besides these, a large number of *Crotons*, *Selaginellas*, &c. We advise horticulturists to try this method in a low moist house, and, in giving heat, moisture, and light in sufficient quantities to the cuttings, they may count with certainty upon the result.

Versailles.

A. TRUFFAUT.

RE-POTTING AND TOP-DRESSING HARD-WOODED PLANTS.

IN an article on "Surface Dressing," by Mr. Muir (p. 203), after treating of its application in the case of several subjects, he speaks of applying it to "large plants of *Camellias*, firmly rooted into pots or tubs, and whose lives would be endangered by a complete shift." Allow me to say that I do not think there ever yet was an instance of *Camellias* being so rooted as to have their lives endangered by complete removal. As to top-dressing *Camellias* there is a considerable difference of opinion. I am acquainted with some who grow these plants well, who every season apply top-dressings; of course removing some of the existing surface soil to make way for the new. Many others, who grow their plants equally well, never surface-dress at all, and would never on any account be induced to do so. Many years ago I selected a number of plants that had not been re-potted for a considerable time, and surface-dressed them each season, for some five or six years; an equal number in an exactly similar condition I left untouched during this time, and at its expiration there was little difference in the two lots of plants so treated; what little advantage there was rested with those that had not been surface-dressed—the unavoidable mutilation of the roots in removing the old soil, to make way for the new, evidently doing a greater amount of harm than the new soil did good. Mr. Muir then goes on to say that "*Azaleas* may be benefited in the same way." Here his advice is as mischievous as it well could be. There are no plants in existence, not even hard-wooded *Heaths*, that are more susceptible of injury from interference with the surface roots than

Azaleas. The roots of an Azalea in good condition, from the surface to two or three inches below it, lie crowded together in the soil almost as closely as the hairs on the back of an animal; and it is utterly impossible to remove any of the surface soil without destroying them. Azaleas, also, less than almost any other plants, can bear meddling with the collar, a very small amount of soil placed to which will induce them to go off at this point. The mutilation of the roots of plants, especially those of an evergreen nature, and that are grown in pots or similar appliances, is much too lightly thought of. I am acquainted with numbers of individuals who essay the growth of hard-wooded greenhouse plants—Azaleas included—yet who never bring them to perfection; one of the principal causes of this is the way in which the roots are mutilated at the periodical pottings they receive. How is this important operation very often performed? The plant is turned out of the pot, the drainage which is enveloped by thousands of roots, is torn out in a rough manner, without any particular care being taken to inflict as little injury as possible, then innumerable active roots, which lay thickly round the sides of the ball, are torn and mutilated with a sharp pointed stick, which is thrust in amongst them over every half-inch or so of the whole surface, this being done with the intention of assisting the roots to enter the new soil; the plant is then transferred to its new pot, the requisite soil added, and the operation is completed to the satisfaction of the operator. Now, what is the condition of a plant so treated? It will either be just about to commence, or, in many cases, will have begun, to make its growth. But what is there to support the growth? All the best feeding roots, which, unquestionably, are those that lay at the outside of the ball, have been broken and lacerated, and are completely paralysed for many weeks, during which time the growth goes on; but under such conditions that the leaves are never more than half developed, the shoots are proportionately weak and puny, and the whole a prey to red spider and other insects, which seldom fail to attack a plant in a weak condition. The question may be asked, why are hard-wooded plants so treated? My reply is, simply from the difficult matter it is to "unlearn." Not only is such treatment as this too often taught by word and example, but instructions of a similar nature are conveyed by almost every treatise that has been written on the subject. I am not aware of a single publication that has appeared for the last twenty-five years on the cultivation of these plants that does not, more or less, advise such a practice. Why, again it may be asked, is this so? Because those who have written on their culture are practically unacquainted with their requirements. As far as my own practice goes, I like to complete this work of re-potting all hard-wooded subjects, with the exception of Azaleas, by the end of the present month, so as to get them established before the weather gets so hot as to necessitate the application of water at too short an interval after potting, and the admission of more air than is beneficial for plants of this description for some time after their removal. I usually proceed as follows. I first look over and select all that require a shift; examine the condition of the soil as to dryness, and give them a good soaking with water, so that they may not again require its application for as long a time as possible after they are transferred to the new soil. I allow them a day to drain, and then commence potting. In removing a plant from the pot it has already occupied, I never, if it does not come out easily, attempt to force it, but gently break the pot with a hammer; for, if there happen to be any inequalities in the shape of a pot, and the ball is forced out, a portion of the roots are almost certain to be injured, and it is much better to sacrifice a pot than a valuable plant. The plant is then laid down on its side on the potting bench and the drainage removed, care being taken not to mutilate the roots that enclose it any more than can be avoided; were it not for the absolute necessity, I should never remove the drainage at all, but, were it left, repeated shifts would necessitate pots so deep in proportion to their diameter that they would be very unsightly, or otherwise have no room for drainage at all. The plant is then transferred to its new pot, and the operator must be careful not to injure the side roots with the fingers in its removal. The soil is then put in a little at a time and rammed with the potting lath regularly until it is filled up to the surface, making the whole as solid as the ball of the plant. I have had a pot containing a hard-wooded plant so treated broken by accident within ten days after its removal, and at the time the roots were entering the new soil to an extent that would not have taken place in three months had they been mutilated, as so often done. Neither is the necessity for considerate treatment to those vital organs—the roots—confined to this section of plants; the latter are, however, more delicate and difficult to cultivate than any other subjects that come under the gardener's care. In my early gardening career, long before I had much to do with plants of this description, I was a good deal engaged in general fruit growing and forcing, and I then came to the conclusion that half the failures that arise in the cultivation of our leading fruits

are attributable to a want of condition in the roots or an insufficiency in their quantity, generally caused by bad treatment or no treatment at all—an opinion that I have not yet had any reason to alter.

T. BAINES.

Influence of the Stock on the scion in Variegated Plants.—A curious fact in connection with the Aucuba-leaved variety of *Passiflora quadrangularis* has been made known by M. Lemoine, of Nancy; grafted upon *Abutilon Thompsoni* and *P. Impératrice Eugénie*, a scion of this plant has communicated its variegation to both stocks, but only to such shoots as have pushed out above the spot where the graft was inserted. Of the shoots in which the variegation was most marked slips have been taken, and there are now two coloured varieties which may be perpetuated by means of grafting, and which it is the intention of M. Lemoine to bring out as soon as they have been produced in sufficient number. One remarkable circumstance noticed by M. Lemoine is, that the best variegated shoots have appeared upon a naturally green stock, whilst the scion, although still living, has never pushed growth, and lost, in fact, its two leaves at the end of two or three months. In each case the *Passiflora* never sent out variegated shoots below the graft. Another fact of the same kind is, that a scion of *Tacsonia Buchananii* was inserted in the same variegated *Passiflora quadrangularis*, and that this graft has now commenced to take up the variegation of the stock. In this case the scion has been affected by the distinctive peculiarities of the stock; in the preceding cases the result was of an entirely opposite character.

Pitcher Plants at Drumlanrig.—A few months ago I saw a collection of *Nepenthes* pitchers from Drumlanrig, and amongst these were two of *N. distillatoria*, which were also seen by Messrs. Veitch, who grow these plants so well; and they considered them to be the best they had ever seen of that species. I carefully tested these two pitchers, and each held considerably over a pint of water; indeed, so impressed was I with their extraordinary development that I took precautions to preserve them, and, only the other day, placed them in the hands of the museum authorities at Kew. I hope that Mr. Baines's remarks (see p. 233) will not deter cultivators from growing Pitcher plants in baskets; for I consider that it is a very successful plan to adopt, and this mode of culture is largely practised by Messrs. Veitch, who, it must be acknowledged, grow Pitcher plants well. *Nepenthes* like a very humid atmosphere, the nearer saturation point the better; and if, in addition to this, the surface of the peaty compost is covered with fresh living *Sphagnum*, there will be no occasion to fear that the roots will die off at the points. The finest plants of *N. Hookeri*, *N. sanguinea*, and *N. villosa*, that I ever saw were grown in baskets; and this mode of culture is to be recommended more especially in the case of the dwarf-growing kinds. I do not know how Mr. Thomson grows his big pitchers, but I know that the large free-growing species exhibit marvellous vigour when planted out. Mr. Speed had some fine plants of *N. Rafflesiana* and *N. Hookeri*, which produced large pitchers in the Amherstia-house at Chatsworth a year or two ago, and I believe these were planted out.—F. W. B.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Lapageria rosea from Seed.—I believe the best method of growing this beautiful greenhouse climber is from seed. It seems to be the easiest way of propagating it, and I mention the circumstance that those who are fortunate enough to have large specimens of this plant may do their best to obtain seed.—A. B. Y.

Different Degrees of Fragrance in Hyacinths.—Until this winter I was under the impression that all Hyacinths were equally sweet-scented. My attention being drawn to the subject, I find the greatest difference among all the colours; and as we only grow them for their perfume, and never trouble with the names, I would be very glad if any of your correspondents who have noticed this peculiarity in Hyacinths would give me a dozen names of each of the three colours—red, white and blue—among sweet-scented singles. For those who are overpowered by the smell of Hyacinths, it may be an advantage to know the names of those kinds that are devoid of the true Hyacinth perfume. In a pot of three reds before me, whilst two pinks are scentless, the perfume of a third, a rose-coloured kind, is delicious, the spikes of all being in perfection.—F. J. HORN, *Wardie Lodge, Edinburgh*.

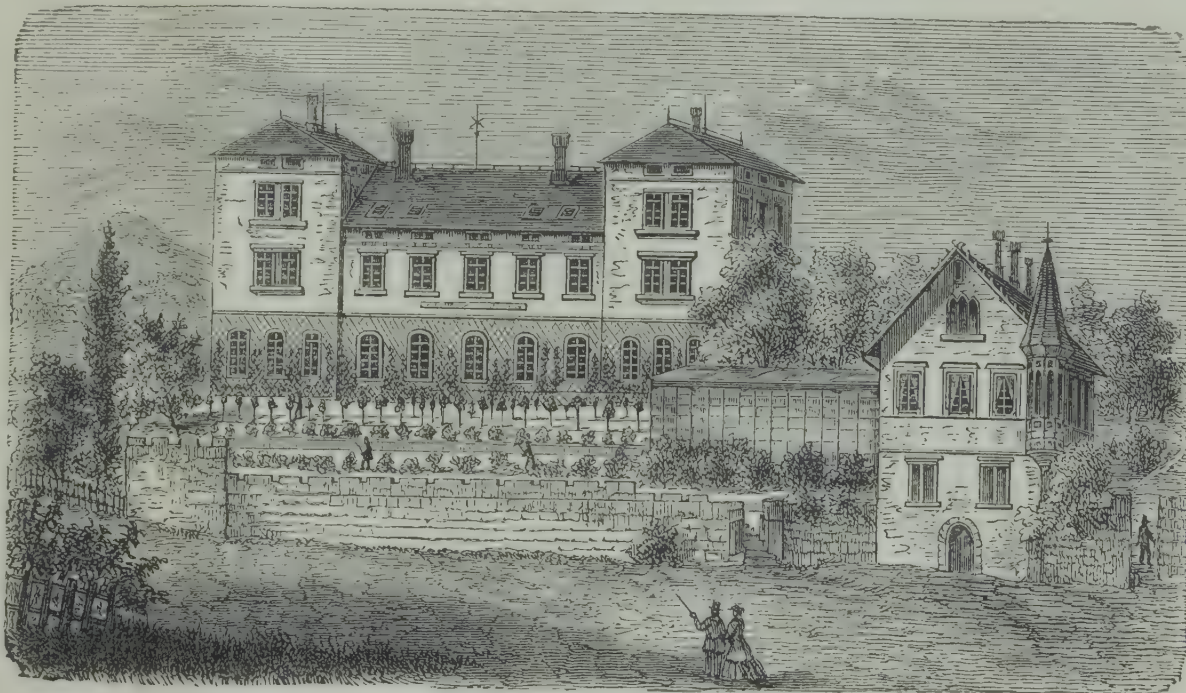
Value of *Eucomis punctata* as a Hardy Window Plant.—I have a bulb, whose 2 feet flower-spike opened its blooms in the beginning of October, nearly six months ago, and these are almost as fresh as when first expanded. The plant is *Eucomis punctata*. It has stood the cold of the past winter in the window of a room in which there has been no fire. I grow many of them in pots, the persistency of the flowers making them very useful, and I should think almost indispensable to window gardeners. Although quite hardy, this plant is more suited for pot-culture. My treatment is as follows:—Shake out, divide when necessary, and re-pot in April, using sandy, rotten turf and decayed manure. Stand the pots during the summer in a hot sunny situation giving plenty of water; thus treated, in the early autumn every bulb shows a spike of flowers, when they are removed to the greenhouse or sunny window. The seed-vessel swells in the centre of the fragrant flower without the petals shrivelling or dropping, which serve as a calyx to the pod.—J. M., *Hawkechurch, near Axminster, Devon*.

REUTLINGEN SCHOOL OF GARDENING.

Of the many German schools of gardening, probably none has acquired a greater reputation, or turned out more able horticulturists, than that conducted by the eminent pomologist, Dr. Edward Lucas, at Reutlingen, in Württemberg. Since the opening, in 1860, it has been attended by over 700 pupils, representing, as regards nationality, almost every country in Europe, and even Africa and America; and, during the winter of 1872 and the summer of 1873, the students numbered seventy-one, many of them sent to the establishment at the expense of their respective governments, or of different horticultural and agricultural associations. Although pomology is, perhaps, the subject which occupies most attention in the school, and the one with which its name and reputation are principally associated; still, the course of instruction includes floriculture, Vine culture, market-gardening, dendrology, laying out of landscape gardens, and all other branches of horticulture; the same being taught by Dr. Lucas, his son, and two head, or superintendent, gardeners. For the preliminary and fundamental subjects, such as physics, geology, chemistry, &c., competent government school teachers are engaged. To meet the requirements of more or less advanced pupils, who have different careers in prospect, the institution is divided into two sections, a so-called superior school of pomology and horticulture, and a lower school of gardening, and the course of instruction in each occupies one year, or extends over three, according to the young man's previous experience and proficiency. In some instances, in the case, say, of schoolmasters and superintendents of parish or district plantations, even a year is often longer than could be spent at Reutlingen, and for that class of students Dr. Lucas has arranged a short spring course, especially adapted to their wants. As regards the future calling of the young men in the upper section, many of them intend to be landscape-gardeners, nurserymen, and farmers; whilst those in the lower division mostly become head-gardeners, nurseryforemen, florists, seedsmen, and fruit-growers. In addition to attending the different lectures, the students are expected to devote several hours a day to practical work, and indeed, under the direction of Dr. Lucas and his assistants, to perform (with very little outside help) all the operations necessary to the successful management of the orchards, nurseries, and gardens belonging to the school. The latter, which are cultivated with a view to profit, cover some 23 acres, and as the authorities of the institution, besides carrying on an extensive seed and fruit tree business, undertake the laying out of parks and pleasure-grounds, it will be seen that the pupil at Reutlingen has ample opportunity of familiarising himself with the details and routine work of his future vocation. As some remuneration for his services, at first 4d., and, after the first year, up to 1s. a day—making a total on the 305 working days of the twelvemonth, in the one case of about £5, in the other of something like £15—is deducted from his annual school fees. These, in the upper division of the establishment, amount to £27 per annum (inclusive of board, lodging, attendance, &c.) during the two first years, and to £16 during the third; in the lower section, to £24 and £17 respectively. A private bed-room costs from £5 to £6 per annum extra. No charge is made for instruction after the third year, should the student wish to remain beyond that time. Prizes and honourable mentions are awarded those pupils who distinguish themselves in the periodical examinations, and each youth on leaving receives a certificate giving an account of his behaviour, application, and progress. Should the certificate report favourably with respect to conduct and ability, it may be regarded as a sure passport to a remunerative appointment, the authorities of the school having at all times more applications for competent young gardeners and fruit-growers than they are able to satisfy. On leaving the institution,

the young men are encouraged to record from time to time their future horticultural experiences, making known, for the benefit of others, any new mode of culture, &c., they may be able to recommend; and some of the best articles in the "Gardeners' Year Book" and Journal of the German Pomological Society, edited by Dr. Lucas, have been contributed by old pupils, who now occupy important posts in all parts of the Continent. This useful interchange of experiences forms, as it were, a continuation of the discussions held one evening a week during the school term. On these occasions the students meet to compare the results of observation and inquiry; frequently a paper is read on some subject more particularly engaging their attention at the time; and Dr. Lucas, or one of his colleagues, is always present to give his opinion in any case of doubt or difficulty. For the benefit of any amateur gardener or fruit grower who may feel inclined to enlarge his knowledge of horticulture by spending a short time at Reutlingen, we may mention that outsiders, or occasional students—"hospitanten," as they are called—are admitted to any of the courses, can join in the botanical excursions, and, if they please, take part in the practical work of the school on payment of £1 4s. per month. For wet days, should the hot or greenhouses not attract there is an excellent library and collections of all kinds (carpological, geological, &c.) to fall back upon, and, in fine weather, the rich flora of the Black Forest and neighbouring Swabian Alps will be found to lure one in all directions. Beautiful spots and objects of interest within reach of Reutlingen are, indeed, so numerous, that the pupil, free to arrange his own plan of studies, would be under great tempta-

tion to make so-called "botanical excursions" a prominent feature of his programme. Supposing, on the other hand, the chief aim in his rambles is to see carried out on a larger scale the methods of garden, and especially fruit, culture, recommended in the lecture hall and practised as far as space will allow at the school, he need not wander far beyond the precincts of the town, as the more immediate environs of Reutlingen probably constitute (in the more restricted sense of the word) the most "fruitful" portion of the most fruitful



Reutlingen School of Gardening.

countries of Germany, viz., Württemberg. The accompanying illustration represents the principal building of the Reutlingen Institution, which will accommodate about fifty pupils. T. S.

Yew Poisoning.—During the last frost I had two valuable yearling colts in a 4-acre paddock. They had a warm shed to run in and out of, and as much hay as they liked to pull out of a rack; also a liberal allowance of crushed Oats, with bran and cut hay. They were seen well on the 30th December, at five o'clock at night, when they were fed, and both commenced to eat their corn as usual. Next morning, on going to them, one was found dead. I went to the paddock and found the colt just lying outside the shed on the snow. It had apparently dropped and died without a struggle, for the snow was not in the least displaced. The carcass was much swollen, and, when the head was severed from the neck, a large quantity of frothy brown-coloured fluid escaped from the trachea, and a black fluid blood oozed from the large vessels of the neck. The stomach was much inflamed, and moderately full of crushed Oats, bran, and cut hay (the evening feed), mixed with a quantity of Yew. Mr. Dawson, writing from Weston Park respecting the deer which were poisoned during the late frost, says:—"The animals got over the fence into one of the plantations, and ate the ends of the branches and the bark of the Yew trees. Three of the deer were found dead close to the tree of which they had eaten. The carcasses were warm and much swollen when we found them. The stomachs were full of Yew." My impression is that the activity of the poison is increased by the frost drying up the sap of the Yew.—"Veterinarian."

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Sowing Parsnips and Carrots.—A full crop of Parsnips should now be sown without delay. This is a somewhat deep-rooting vegetable, and is much improved by the soil being deeply stirred. A bed of Early Horn Carrots should also be sown, as well as a little Turnip seed. For this sowing there is nothing better than the Red Topped American Stone, which is little inferior, in point of earliness to some of the more commonly-grown kinds, and possesses the desirable property of not running to seed when sown early, as some kinds do. Round Spinach may be sown now, either by itself or between rows of Peas; and in the latter position it will come in before it interferes with the gathering of the Peas.

Globe Artichokes.—The roots of Globe Artichokes, which have been protected in the usual way by litter laid round the crowns, and a slight ridge of soil covering them, should now have this protection removed; begin at one end of the row by first removing the soil, and then clear away the litter. If the plants are in good condition, they will now be pushing a far larger number of shoots to each crown than they can support, and they should, therefore, be removed, with the exception of some four or five of the strongest to each root. The best implement with which to take these off is an ordinary planting trowel; and, if the suckers are required for planting, they should be got off with a few root fibres, and at once be planted, four or five together, at distances of a yard apart in the rows, and with 4-foot spaces between the rows. This vegetable cannot bear a situation where there is any stagnant water. The roots in such soil generally die during the winter; it is necessary, therefore, to select a dry spot for it, and, further, it likes plenty of manure and deep cultivation. If the weather happens to be dry, give the plants a moderate watering, to settle the soil round the roots so as to get them established without delay. Plantations, made thus at the present time, will produce a good crop in the autumn, after the established beds have ceased bearing; and where this vegetable is held in estimation, and required over as long a period as possible, some should be planted each spring, even if it be necessary to remove a portion of the older stock to make room for them. Between these newly-planted Artichokes, a crop of Radishes, Spinach, or Lettuce, may be put in the ground, and these will come to maturity before being in the way.

Cauliflower and Lettuce.—Cauliflower plants from frames may now be planted out in well-dug, highly-manured ground—a planting trowel being used to remove them, in order that as much root as possible and a good ball of earth may be secured—planting them 2 feet apart each way, which, for this crop, will be ample space. Where Cauliflowers have been wintered under hand glasses, a portion of the plants must now be removed, some three of the strongest being left under each glass, and as these undisturbed plants advance in growth raise the glasses on bricks—removing them in the daytime, so as to give plenty of air, but keeping them over the plants at night. This not only protects them from any severe frost that may occur, but in mild weather brings them on quicker than would otherwise be the case. The plants that have been removed from the hand-lights will form a succession to those remaining. Should there be an indication of keen frost before these newly-turned-out plants get established there is no better protection for them than 8 or 10-inch flower pots placed over each. These pots effectually ward off the frost, and where the quantity grown is limited—as it is in an amateur's garden—the labour of removing and replacing them is small compared with the benefits to be derived from their use. Lettuce from frames and under the protection of south walls should also now be planted out in well-prepared and richly-manured ground—the richer the better—in order that they may be grown large and crisp, and also to prevent their running early to seed. Plant them 15 inches asunder in the rows, with the same distance between the rows. In taking them up use the planting trowel so as to check them as little as possible—the barbarous system of tearing up plants intended for re-planting, entailing, as it does, the certain destruction of their roots, should never be tolerated in a garden where there is any pretension to intelligent management. For this reason the fork or planting trowel should be used in taking up for re-planting even the commonest or least valuable vegetable—the little extra labour involved is as nothing compared with the gain. Lettuce or Cauliflower plants that have been sown in a little warmth must, as soon as large enough, be gradually hardened off and pricked out in frames, sufficient air being given them in mild weather to induce a sturdy growth.

Planting out Peas.—Peas that were sown in turves, tiles, or boxes, under the protection of frames or pits, having been previously well hardened by the admission of plenty of air, should now be planted out. Choose a sunny sheltered situation for them; and, as soon as they are planted, put small sticks to them, and if a few Spruce branches are at hand place them in the ground at the sides

(but not so as to weaken the plants by excluding light) in order to shelter them from cold cutting winds. Peas that are sown in the open ground should, as soon as they get fairly up, have the small sticks placed to them, for even the little shelter thus afforded has a marked influence on their growth. In some localities sparrows do not attack the Peas until the crop is fit to gather; in other places, these birds commence their depredations upon the points of every Pea as soon as it comes through the soil; and, unless means are taken to prevent it, completely spoil the crop. I have found nothing so effectually deter them as thick cotton thread, about the strength of a single strand ravelled from an ordinary spun dip candle-wick. Such material as this is easily obtainable in the manufacturing districts; the reason of its being better than ordinary sewing cotton is that it shows better on account of its thickness. Two or three threads, loosely hung on the sticks on each side of the row, and allowed to move in the wind, I have always found sufficient to keep them off; in some places it is even necessary to keep these threads on until the early crops of Peas are in bloom, or the sparrows will persistently nip out the points. Soot, dusted on the Peas, will, so long as it remains, prevent their depredations, but the first shower removes it, thus necessitating repeated applications, until, in its effects, it becomes poisonous to the Peas.

Tomatoes.—Tomatoes for planting out on walls, or similar places, should at once be sown in a well-drained pan, and the seed slightly covered with sifted soil in a little heat, either in a dung-bed already at work, or a Vinery that is started. The cultivation of this vegetable in the open air for the last two or three years has become very precarious in many places. It suffers from a disease very similar to the Potato disease; consequently, where Tomatoes are required, some provisions should be made for growing them under glass. They do well in pots, bush fashion, with a few sticks to support them, or planted out, and trained up to the roof as Cucumbers.

Herbaceous Plants.—There are numerous species of vigorous-growing herbaceous plants that soon impoverish the soil. Many of these summer and autumn blooming plants, such as Phloxes and Asters, may at once be taken up with advantage, the ground they have occupied well enriched, and then re-planted. If the plants have got too large—in which case the bloom is never so fine—they may at the same time be divided into two or more pieces. Spreading plants, such as Arabis and Alyssum, should now be regulated, any portions that have died off during the winter being removed, and a little fresh soil worked in amongst them, where the stems are getting bare. Remove Sweet Williams from the nursery-bed, to which they were transferred from the seed-bed last summer, to the situations where they are intended to bloom. These plants answer best when treated as biennials—the stock being kept up by yearly sowing—as they have a great tendency to go off at the collar after flowering. Now is a good time to make any additions required to the collection of herbaceous plants. Many of the principal growers of these keep a considerable stock of the best kinds in pots, and, by this means, they can be moved at any time without injury. Hollyhocks may now be planted. Where the dreaded disease attacks these plants, it generally makes a clean sweep in a few weeks. I should advise anyone, having a healthy stock, on no account to introduce any others amongst them; for, so far as I have heard, it has never made its appearance, except where there has been an introduction of plants from other stocks.

Pits and Frames.—It is time now to make a sowing of Melons. These can be raised in an existent Cucumber-bed, or similar place; the seeds sown (a couple each) in 48-sized pots, drained with some fibry turf; the pots half-filled up with good loam, pulverised by hand, or sifted. Just cover the seed, and fill up the pots with similar soil when the plants have grown a few inches high. Attend well to everything in this department that requires heat by applying the necessary linings, and keeping the whole well-protected with litter, to ward off the effects of the cold winds. Dahlia roots should now be put in, to start in warmth; for this purpose, nothing is more suitable than a dung-bed, with a bottom-heat of not more than 60°. The proximity to the glass in a frame of this description keeps the shoots much stouter, and in better condition for rooting when taken off, than when placed on the floors of Vineries, or similar places, where they are at a long distance from the glass, in consequence of which the cuttings are drawn up soft and weak. The seeds of annual Stocks and Asters should now be put in. They may be either sown in shallow pans, boxes, or in small pots, a few seeds in each of the latter. Keep them near the glass as soon as they are up; and be very careful in giving water to the Stocks, until after they have been transplanted, and have taken hold of the soil, as, previous to this, they are most liable to damp. Continue to strike cuttings of all bedding plants that are required, and bring this kind of work to a conclusion as soon as possible, so that the plants may gain strength, and get hardened off, before the time for turning out has arrived.

Houses.—If fire-heat was used a short time back as advised, the Vines will now be breaking; they will require the use of the syringe with more moisture in the atmosphere and the admission of less air—especially by closing early in the afternoon—than the pot plants like. Everything in the shape of bedding plants, that may have been wintered here, should be at once removed to pits or frames, and there sufficiently protected at night. Pelargoniums, intended for blooming indoors through the summer must also be removed, otherwise they become so weakened and drawn as to be spoilt. Fuchsias, Camellias, or any plants of this description, will be rather benefited by the treatment the Vines require. Do not cause a draught or cold current to pass through the house by giving air from the front, but confine its admission to the top. In the case of Vines that have been started early, and have now pushed their shoots to a considerable length, let them be tied down to the wires as soon as they are large enough, not allowing them to get too strong before being trained; stop the shoots at the second joint past the bunch. Syringe every afternoon as soon as the house is closed, until the bloom begins to open.

INSECTS INJURIOUS TO ROOM PLANTS.

THE family of plant-lice (Aphides) supplies by far the greatest number of the pests which infest plants grown in rooms, and, on account of their minuteness and remarkably rapid propagation, they are very difficult to extirpate. The peculiar formation of their mouth enables them to insert their proboscis into the cells of the tender parts of plants, and to suck the sap which should go to nourish growth. Discoloration of the bark and foliage, shrivelling of the leaves and shoots, and the formation of galls and excrescences, are the results of their ravages. The more tender and juicy the leaves and young shoots are, the more easily can the plant-lice pierce them and suck out the sap, and the faster the lice grow and multiply. Strongly-forced plants, which are kept too warm, or plants which do not get air enough, consequently afford a specially suitable nidus for these insects. The means both of preventing their devastations and, I may say, also of extirpating them where they have established themselves, consist in good culture, cleanliness, fumigation, sprinkling or washing with various liquids, and dusting with good insecticide powders. By good culture, which includes ventilation at the proper time, and keeping the plants in a position not too warm nor too far from the light, the plants are enabled to form strong healthy leaves which are less liable to be attacked by such insects than if they were less favourably circumstanced. By attending to cleanliness, all the decaying leaves will be removed on which the eggs and young of the lice often lie. When young shoots and leaves are much infested with lice, the best thing to do is to cut them off altogether and burn them, as, when so attacked they, even when thoroughly cleansed from lice, are usually distorted or even perish soon after. Plants from which the lice are to be removed should be shifted from among the other plants into a place where no other plants are near them. The stem-shoots and both sides of the leaves should be carefully brushed, and then washed with warm water and a sponge, to remove the "honeydew" with which the stems and leaves of such plants become covered.

Remedies.

The pot and the surface of the soil should, in all cases, be cleaned and thoroughly freed from all lice which may have fallen on them. This is the surest way of getting rid of the Woolly Louse (Coccus) and the Shield Louse (Aspidiotus), which do not appear to be much affected by fumigation. Moreover, when the Green-fly (Aphis) has been killed by fumigation the plants should be afterwards sponged over. Fumigation with tobacco is the only means that should be employed. Tobacco leaves of the cheapest kind should be placed in a vessel or fumigator on some live coals and allowed to burn for some time until the apartment is quite filled with a dense smoke. In rooms that are usually occupied, tobacco should not be employed, as its offensive smell will remain for weeks afterwards. The plants should therefore be fumigated in a small room set apart for this purpose, or under a bell-glass of suitable dimensions in a large room. When fumigation is employed against the Woolly Louse, Thrips, &c., the smoke should be made very dense and strong; the fumigation should also be repeated after a few days in order to kill any insects which may have been hatched

since the first fumigation; care should be taken not to fumigate more than is necessary. Light fumigation with tobacco may be used with most plants without injury to them, provided the plants are not placed too near the vessel containing the heated coals. Strong fumigations should not be employed with plants which have tender leaves or leaves covered with hairs, such as Heliotrope, Gesneraceæ, Melastomaceæ, as the total loss of the leaves is often the consequence of such treatment. The best thing to use in sprinkling is a solution of the genuine Persian insecticide mixed with water. About 3 ounces of this insecticide should be put into an ordinary glass bottle; the bottle should then be filled with spirits, and left corked for about eight days in a sunny window in a heated room. About a 200th part of this should be added to water warmed to about 123° Fahr., and sprinkled through a fine syringe on the leaves and stems affected. The evening should be selected for the operation, and the sprinkled plants should be placed for the night under a glass, or in a cellar, or covered with oil-cloth. The object of this is to prevent the rapid evaporation of the mixture; and, moreover, the fumes of the evaporating poison will destroy any insects which may have escaped the sprinkling. This is an excellent remedy against Aphis, Thrips, and Red Spider. When it is used against the Woolly Louse or the Shield Louse, one part of the mixture to fifty parts of water should be employed, and the sprinkling must be very thorough. A solution of black soap and guano may also be used, but it is not so effectual. Brushing and sponging is a still better plan than sprinkling, as the crevices and undersides of the leaves are more effectually cleaned in this way. In the case of the Shield Louse or Scale, it is the only sure method of removing them. After brushing, a sprinkling of strong liquid insecticide, or of a mixture of tobacco-water, potash, and black soap will be useful; the plants so sprinkled should be washed with clean water next day. The last remedy mentioned is dusting with insecticide powders. When these are used, the plants should have been previously sprinkled with water, which will retain the powder better and prevent its being scattered. The principal kinds used are the Persian insecticide, tobacco-powder, lime, wood and peat ashes, gypsum, and, for the Woolly Louse and the Scale, powdered sulphur. Of Aphides some are winged, and others not. The common Green-fly infests Carnations, Fuchsias, bulbous plants when forced, and other room-plants, and may, like other kinds of aphis, be extirpated by a light fumigation, or by other means already described. The Water-lily Aphis (Nymphæa) infests Alisma, Nymphæa, and other water and bog plants. In the aquarium it attacks Limncharis, Pontederia, and similar plants. The remedy is to sprinkle the plants with some of the insecticide mixtures, or to fumigate lightly, covering the aquarium with an oilcloth for one night after the operation. The Rose Aphis (*A. rosæ*) is bright green in colour. It infests the under-surfaces of tender-leaved plants, such as variegated Caladiums, and many other stove and greenhouse plants. The Olive-green Aphis (*A. olivacea*) chiefly attacks the young shoots, leaves, and buds of hard-leaved plants, such as Camellias and Palms, which, when they are numerous, they cover with an unsightly incrustation. The Pelargonium Aphis confines itself to Pelargoniums and other tender-leaved green-house plants. The Orange Aphis infests the young shoots and the under-surface of the young leaves of the Orange tree. The common Coffee or Woolly Louse (*Coccus adonidum*) can only be extirpated by strong and repeated fumigations. The plants should also be cleaned and sprinkled with or dipped in some of the liquid insecticides already mentioned. When cleaning the plants, all tyings of bast-mat, &c., and the sticks to which the plants are fastened, should be removed, as well as all loose chinky bark from the stems, as these are generally full of eggs.

Scale Insects.

Of the Scale or Shield Louse (*Aspidiotus*), it may be mentioned that only the wingless insects run; the older ones, whose legs have been gradually absorbed into the body in the course of their growth, remain fixed to the spot where their proboscis has penetrated the plant. Over the insect thus fixed a mussel-shaped scale is produced by a secretion from the body. Under cover of this scale the insect lives, and lays its eggs. The young larvæ, when hatched, creep from under the scale and

spread themselves over the plant. The Oleander Scale infests hard-leaved greenhouse plants (often thickly covering the stems and the leaves), such as Nerium, Arbutus, Magnolia, Azalea, &c. It especially attacks Oleanders which are kept in too warm and dark a position. The only way to remove it is to clean the plants with a brush, and then wash them with a mixture of tobacco-water, potash, and black soap. A thick dusting with sulphur is generally efficacious, but not so much so as the means just named. These insects spoil the appearance of the plants; no time, therefore, should be lost in removing them when they show themselves. Other species of this genus, which must be extirpated in the same manner, are the Rose Scale, the Cactus Scale, the Laurel Scale, the Palm Scale, the Pseudo Scale (*Lecanium*), Pine-apple Scale, and the Nightshade Scale, which infests *Cestrum*, *Solanum*, and tender-leaved hot-house plants. The Thrips, as most cultivators know, has a well-developed feeding apparatus. It resembles the plant-lice in living by suction, and it propagates itself by means of eggs. The Brown Thrips is small and slender, scarcely a line in length, and, when full grown, is of a brownish colour. It infests the under-surface of the leaves of *Dracæna*, *Cordylina*, and many other favourite room-plants, and is one of the most destructive of small plant pests. When leaves are attacked by it, they lose their colour, and become whitish in spots or entirely so, and, moreover, are dotted with small black points, arising from the excrements of the insects. The best remedy is to sprinkle or dip the whole plant in some liquid insecticide. A slight fumigation, or frequent sponging, should also be resorted to. The full-grown insect is very lively, flies fast, and spreads quickly. The eggs are hatched in the space of twenty-four hours, and the larvæ remain together for the first few days, after which they soon spread over the whole plant. The Black Thrips resembles the last in its habits and shape, and requires the same remedies. It is slender, of a pale black colour, and covered with rough hairs.

Spiders, Woodlice, and Worms.

Among Spiders, the only species injurious to plants are the small kinds which belong to the genus *Acarus*. Only one species infects plants grown in rooms. This is the Red Spider; it is a small spider-like insect, with eight legs, and is scarcely visible to the naked eye. Its colour is reddish, yellowish, or brownish, with a few more or less confluent dark-brown marks on both sides. It infests various plants, sucking the sap from the leaves, which lose their colour in consequence. The white-spotted appearance of the leaves, and the cobwebs which these insects produce, are signs of their presence. The drier the air of the apartment the more favourable is it to the production of these pests. They attack soft-leaved and hard-leaved plants alike, and succulents of all kinds. The best remedy is to wash or dip the plants in liquid insecticide, and the plants should be well sponged some days afterwards. As this insect spreads very rapidly in a dry atmosphere, it is an excellent plan to dip the plants in water from time to time. The Woodlouse, which preys on the young shoots of tender plants, may be trapped by means of hollowed-out Carrots or other roots, or dry Bean-stalks, or by fastening two boards together with a small space between them. They will creep into these, and, when the traps are examined every morning, may be shaken into boiling water. Slugs are sometimes troublesome in plant-cases. Where traces of them are observed, they must be looked for and caught at night with a light. Of Worms the only hurtful kind is the common earth worm; it infests the balls of pot plants and spoils the soil. It also stops up the drainage-hole in the bottom of the pot, so that water cannot escape, and the soil becomes sour in consequence. The presence of worms in a pot is indicated by the accumulation of their casts on the surface of the soil. When a pot is suspected of containing worms, it should be tapped smartly with the hand; the worms in alarm come to the surface, when they should be seized at once, otherwise they will quickly retreat to the centre of the ball, so soon as they feel the least touch. If they cannot be dislodged in this manner, the ball must be carefully removed from the pot and examined, but not broken. Should this also fail, then water the pots with water heated to 123° Fahrenheit, or with

an infusion of tobacco, Walnut leaves, or with liquid insecticide, or a solution of guano. This will send the worms either to the surface or to the sides of the pot, when, by lifting out the ball, they may be caught and killed. If the pot is placed half-way in a vessel of water heated to 123° Fahrenheit, it will be found the surest way to send the worms to the surface.

M.

IVY-CLAD TREES.

By JAMES M'NAB, Royal Botanic Gardens, Edinburgh.

Few will deny that a forest of Ivy-clad trees, at any season of the year, but more particularly during the winter months, when all deciduous vegetation may be said to be at rest, is an exceedingly beautiful and picturesque sight. To encourage the growth of Ivy amongst good and stately trees is very questionable, unless with a view to ornament. In many districts in Scotland I have seen the Ivy almost completely covering very large trees, with only some of the terminal branches protruding, in a healthy condition, through the luxuriant growth of this rapacious intruder. In time, however they also fail, and the injured stems are seen supporting the Ivy long after the vitality of the tree has been lost. Heavy loamy soil is generally very favourable to the growth of Ivy, particularly in sheltered situations. In such localities the Ivy runs freely on the surface of the ground, and ascends the neighbouring trees, preferring in most cases the deciduous kinds. I cannot call to my recollection any instance of Ivy growing on healthy evergreen trees and shrubs (except in the case of the Yew), or on any of the Pine tribe. The Oak, Ash, and Elm, seem to be its chief favourites, and, I may add, its chief victims. In some parts I have seen the Ivy stems all cut round on the surface of the ground, for the purpose of killing it, in order to prevent injury to the tree. In such cases the aerial or stem roots have generally taken such a hold of the living bark that severing the stems has but little effect. Not so, however, with Ivy on walls; if cut at the base it will ultimately die, and can be removed in large brown flakes. When the Ivy assumes a climbing or free-growing character, the leaves possess a more entire shape, and in this condition flowers and fruit are abundantly produced, which is not the case when it is seen running on the level ground, unless it comes in contact with old stone walls or decayed tree stumps. The variegated varieties are very numerous, and many of them rather pleasing. In pot culture (trained) they produce an excellent effect, but when planted against a wall they do not get into that free-growing state characteristic of the green varieties. When grafted or inarched—and this is more particularly the case with the gold and silver varieties—their pendent branches have a pleasing appearance amongst the green varieties, and when so treated they grow much more freely than they do on their own roots. The green varieties are also numerous, but for a speedy wall covering, the variety known as the Irish palmate-leaved is decidedly the best. Besides covering the bare trunks of trees with perpetual verdure, this kind is admitted to various uses in the decoration of our gardens, one of which may be seen at page 265. Its stems cling firmly, by means of little rootlets, to whatever they come in contact.

Moles and their Worm-stores.—In a tract of meadow land in Norfolk, which lies below the level of a tidal river, and which is, therefore, preserved from being submerged by artificial embankments, the mole is not infrequent, although he is regarded by the occupiers with great disfavour. In addition to his ordinary sin of making the Grass-land difficult to mow, he has an ugly trick of boring into the river walls; and, by loosening the sods which hold these walls together, imperils the walls themselves. Mole-catchers are, therefore, in great request, and a few minutes spent in company with one have taught me a lesson on the mole's history which was quite new to me. March is the mole's breeding month; and, in preparation for the appearance of the young ones, stores of fresh meat, in the shape of worms, have been laid up under hills, larger than the ordinary mole-hills, but in the open marsh, which an experienced eye readily recognises. The mole-catcher (in whose company I found myself accidentally) is employed to poison moles, and the food in which he puts his poison is the common earth-worm. Sooner than spend his time in digging for these on the upland, he had come down



IVY ON TREES.

to the marsh to rob the mole's larders, and he hit on these with the sagacity of a terrier sniffing at a rabbit's burrow, and did not open a hill in vain when I was with him. He chose the largest hills which were on the highest spots on the marsh, and opening one in my presence, he laid bare a round cavity, the sides of which were beaten hard by the mole, so as to prevent the worms from attempting to pierce their way out. Inside this there was nearly a quart of fine worms, quite free from any admixture of soil, each worm apparently tied up in a coil or knot, yet all alive. Upon being dragged out of the place in which they had been stored, the worms began to wriggle away; but the mole-catcher put them into the box he carried, and took away his prize. Is this habit of the mole generally known among naturalists? It seems to argue a reflective faculty, great as in the beaver, that the mole should prepare a prison in which worms can be kept alive.—"Field."

THE GARDEN IN THE HOUSE.

EXOTIC FERNS FOR HOUSE DECORATION.

SOME recommend that Ferns, at the annual potting, should be shifted into larger pots than they previously occupied; and that, in performing the operation, the ball should be reduced only where the roots are decayed or the soil effete, but not be otherwise disturbed—a practice which also necessitates shifting into pots a size larger, till both plants and pots become unwieldy. Where Ferns are grown for specimens, this practice is perhaps correct enough; but where, as with most people, the object is to have as many plants as possible in a limited space, and none of them in large pots, a somewhat more summary process has to be adopted. Ferns for house decoration do not require potting more than once annually; consequently, when they come to be shifted in spring the roots are considerably matted. To reduce the balls then by the pricking process, *i.e.*, with the point of a label, is tedious and lacerates the roots unnecessarily. To avoid these evils, and in order to reduce the balls sufficiently to get them back into the same sized pots again, and at the same time to admit of a considerable supply of fresh soil, we simply take the plant out of the pot and with a large carving-knife fearlessly shave a thick slice of the ball off all round, taking a proportionately thick slice off the bottom; and the root-pruning is finished. The plant is then potted moderately firm, in a pot pretty well drained. I do not think there is a better way than this of dealing with matted roots. You get rid of them at once, and, the cut being clean, the main roots soon push fresh rootlets into the new soil, and start a new growth of fronds. All our Ferns are treated in this way, and I do not think we ever lost a plant by this practice. Sometimes, when such as the *Gymnogrammas* get two stems, the balls are cut through the middle, the two halves rounded with the knife, and potted separately in smaller pots for a succession, the older plants being thrown away when room is required. No Fern should be potted in a very dry state, or the chances are that the ball will never get soaked afterwards; therefore, when they are dry, the balls should always be thoroughly steeped previously to potting, by simply setting them in a tub of water kept ready for that purpose. This is the only way to soak a ball that has got thoroughly dry through being overlooked in the watering. For similar reasons, newly-potted Ferns should always be kept well watered after potting, till the new roots begin to get hold of the fresh soil. Ferns, though by no means aquatics, like moisture both at root and top, and thrive amazingly around the edges of a tank, or just above the water, set on inverted pots to keep the roots from contact with it. Though no plants seem to stand extremes of temperature so well as Ferns, I have always found that such as the Mexican and New Holland varieties make by far the healthiest growth in a shady intermediate-house. They will grow well enough along with the tropical kinds; but the foliage is weaker, and, in the case of the Maiden-hairs particularly, the fronds cannot be compared with those developed in cooler quarters for hardness of texture and dark green colour; hence, the latter are far better for decoration, for bouquets, head-dresses, &c., because they stand exposure better. *Adiantums* grown in hot stoves are almost worthless for cutting from, as they wither almost immediately in warm rooms; but hardy-grown fronds will endure a night's bad usage well, and will take no harm for a week or more, on a plant in a vase. It is always well to have a good proportion of Ferns among plants for house-furnishing, and plenty in small pots, along with *Lycopods*, &c. No kind of foliage is more generally adaptable to all kinds of situations and circumstances than that of the Fern; and, when the plants are in small pots, they are always ready for all the emergencies when packing or backing up is required. The common *Lycopod* is a host in itself. A good way to grow it is in common pots or saucers, with a hole in the bottom. It can then be turned out, and used for covering surfaces expeditiously.

J. S. W.

TREES AND SHRUBS.

NOTES ON CHESTNUTS.

The Sweet Chestnut.

THE Sweet or Spanish Chestnut, *Castanea vesca*, is one of the commonest and most valuable trees of Southern Europe, where its Nuts form the chief sustenance of a large portion of the inhabitants. The Chestnut is a near relative of the Beech; and, indeed, under the name of *Fagus castanea*, was considered by Linnæus to belong to that genus. The native country of the Chestnut appears to be in the regions around Kastanea, an ancient city of Pontus, whence the tree probably derives its botanical name. Extensive Chestnut forests still exist in that neighbourhood, and many of the trees are remarkable for their great size and age. The Chestnut was introduced into Greece about 504 B.C., and rapidly spread over that country, where, at the present time, it forms large forests. In the time of Julius Cæsar, during the Roman wars in Asia Minor, it was transplanted to Italy, where it soon became highly esteemed, not only for its excellent timber but also for the nourishing and wholesome food obtained from its Nuts. Greek and Roman writers frequently allude to the tree, and especially to the Nuts. Pliny describes eight varieties of Chestnut as cultivated in Italy in his time; and Virgil, on several occasions, speaks of the Nuts as held in high favour by the country people:

Ripe Apples and soft Chestnuts have we there,
And Nuts abundant to supply our fare.

The culture of the Chestnut was introduced and fostered by the Romans wherever their far-reaching sway extended, and thus it became acclimatised in France, Spain, Germany, and Northern Africa. To judge from some specimens of this tree which, at present, exist in England, it must have been very early introduced into these islands—probably during the Roman occupation. It has also been transplanted to America, where it has become fully acclimatised and flourishes vigorously, especially in the Canadian province of Quebec. In Germany there are extensive Chestnut forests, and the Nuts ripen even upon the slopes of the Harz Mountains. In France, 1,250,000 acres are planted with this valuable tree. The best French Chestnuts are grown in the departments of the Oise and Rhone, where they are to the poorer inhabitants what the Potato is to the Irish peasantry. Large forests of Chestnuts clothe the hilly and mountainous regions of Spain and Portugal, where the mild climate and dry light soil is well suited to its requirements. Some of the finest Chestnut forests in the world are found in the island of Corsica, where the rich and lovely central zone, which lies between the low marshy coasts and bleak snow-clad mountain peaks of the island, is known as *La Castagnicia* or "The Chestnut-land." The Chestnut grows in sheltered situations in all parts of England, Ireland, and the south of Scotland, but the Nuts do not ripen north of the Thames. The finest English Chestnuts are found in Sussex and Devonshire. The Chestnut thrives best in dry, airy situations, upon granite or sandstone formations, and with an eastern or western exposure; it seldom reaches maturity upon chalk or limestone formations, or in a damp heavy soil. The roots are strong, penetrate deeply into the earth, and require a considerable depth of soil. In point of climate, the Chestnut is not so hard to suit as in point of soil; in this country it loves a rich, warm loam and a dry sandy sub-soil. The highest elevation at which the Chestnut is found is upon Mount Etna, where there are some fine trees at a height of 3,800 feet above the level of the sea. Upon the Alps fine strong trees grow at an altitude of 1,800 feet. The young roots are very susceptible of frost, but when the tree has once obtained a firm hold in the soil it can withstand very severe winters. The seeds, however, should never be sown in autumn, as the germinating power is apt to be destroyed by the frosts of winter. The best course is to place the Nuts intended for seed in layers of sand in a dark cellar, and then to plant them out in spring, as soon as all danger from frost is gone. The best seeds for planting in the British Isles are those produced in Devonshire; and next to them German seeds may be recommended. French and Italian seeds do not produce good

trees in this country. The best German seeds are grown in the valley of the Neckar, and in the vicinity of Heidelberg. The trees produced from seeds yield only small Nuts, and to obtain good fruit they must be grafted upon Pear, Apple, or Cherry trees. A very fine ornamental tree may be obtained by grafting the Chestnut on the common Beech. The timber of the Chestnut is not inferior to that of the Oak, and lasts a long time in water, and under or above ground. It is extensively employed for mill-timber, bridges, posts, stakes, hop-poles, and casks. Trees fifteen years' old make splendid hop-poles, 30 feet long and 3 inches thick. The bark is firm, smooth, tough, and very useful to tanners and dyers. The greatest value of the Chestnut, however, is in its Nuts, which ripen in September, and which are largely consumed as an article of diet upon the Continent, in Western Asia, and in Northern Africa. In Corsica, the peasantry subsist almost entirely upon Chestnuts and goat's milk, and the guests at a Corsican wedding-feast are regaled with these Nuts, prepared in twenty-two different ways. In Sardinia, 87,500 cwts. of Chestnuts are annually consumed; and, in France, the produce of the vast Chestnut forests, which form a broad belt across the south-east corner of the country, does not meet the native demand. The Green Chestnuts of Limousin are considered to be the best variety of this fruit. About 70,000 bushels of Chestnuts are annually imported into Great Britain from the Continent.

Geographical Distribution.

Chestnuts are very widely distributed over the northern hemisphere. North America possesses several indigenous species, of which the best known is the Chinquapin Nut (*Castanea pumila*). This tree seldom attains a greater height than 30 feet, and has a handsome shrub-like appearance; the branches are numerous and slender, and the foliage dense and of a bright green colour; the Nuts are small but very sweet and pleasant. This tree thrives well in this country, and is a very handsome object in parks and pleasure grounds. It both grows and looks best when planted in an open airy situation. There is also another species (*Castanea chinensis*) which is found in China, Burmah, and Assam. It is a large tree, and is highly esteemed for its timber. The blossoms of this species are exceedingly pretty; and, when in full blossom, the tree looks as if hung with beautiful yellowish-white tassels; the foliage is also very handsome, and the Nuts are very sweet. Several species of Sweet Chestnut are found in Java, Borneo, and Sumatra, but little or nothing is known of their culture or the value of their fruit and timber. Some of the largest trees in the world belong to this genus. The most celebrated is in Sicily—the *Castagna di Cento Cavalli* of Mount Etna; the trunk of this tree is composed of seven amalgamated trunks sprung from one common root. It measures 180 feet in circumference at the base, but only one of the trunks still shows signs of vitality. Close beside are two other Chestnuts, respectively 70 and 64 feet in circumference. These trees are calculated to be 5,000 years old. In the village of Millet, near Sancerre, in France, there is a Chestnut whose trunk is 48 feet in circumference at a height of 5 feet from the ground. Upon Mount Cenere, in Tessin, there are Chestnuts which must have been saplings when Tell was a boy. The oldest English Chestnut is that at Tortworth, in Gloucestershire. The following description of this tree is appended to a picture of it executed in 1772:—"The east view of the ancient Chestnut tree at Tortworth, in the county of Gloucester, which measures 19 yards in circumference, and is mentioned by Sir Robert Atkins in his history of that county as a famous tree in King John's time; and by Mr. Evelyn, in his "*Silva*," to have been so remarkable for its magnitude in the reign of King Stephen (1135), as then to be called the great Chestnut tree of Tortworth, from which it may reasonably be presumed to have been standing before the Conquest (1066)." The age of the Chestnut varies from 360 to 626 years, so that at the age when the Oak is of most value as timber the Chestnut is utterly worthless.

The Horse Chestnut.

The Horse Chestnut (*Æsculus hippocastanum*) is a very different tree from the Sweet Chestnut. It belongs to the genus *Æsculus*, and is a native of Asia, whence it was intro-

duced into Europe by the Turks. Gerarde thus explains the origin of the name:—"They are called *Equina castanea*, or Horse Chestnuts, because the people of the East countries do with the fruits thereof cure their horses of the cough, shortness of breath, and such like diseases." The Horse Chestnut was first introduced into England in the reign of Queen Elizabeth, by Mr. Tradescant, who cultivated it in his garden at South Lambeth. The Horse Chestnut is a very handsome tree, gives a pleasant shade, and forms an imposing and picturesque object in the landscape. In this country it rarely exceeds 60 feet in height. In North America there are several indigenous species of this tree; it there attains a height of 80 or 90 feet, and a circumference of 15 feet. The bark of the Horse Chestnut possesses strong febrifugal qualities, and is valuable for tanning and dyeing purposes; it also yields a useful drug called *Æsculin*. The timber of this tree is much inferior to that of the Sweet Chestnut; it is best suited for the construction of flooring and packing-cases. It has been calculated that 100 lbs. of Horse Chestnuts contain as much nutriment as 150 lbs. of hay; and in France, Switzerland, and Turkey, it is customary to feed cattle, horses, sheep, and goats, upon a kind of meal prepared from the Nuts. Excellent charcoal and potash are obtained from the wood of the Horse Chestnut, which also makes good fuel. The Horse and Spanish Chestnuts suffer less than almost any other tree from the ravages of insects. One of their most formidable enemies is *Bombyx æsculi*, which deposits its eggs upon young trees. The grub, on emerging from the egg, eats into the pith of the tree, and renders the timber useless. This destructive insect also attacks Apple and Pear trees, Oaks, Alders, Beeches, and Walnuts.

JOHN HUTCHINSON, M.A.

MEASURING GROWING TIMBER.

To those unaccustomed to measuring growing timber, it will appear a laborious undertaking to measure and value two or three thousand growing trees. It is not so difficult, however, as many imagine, and an expert hand will easily measure from 800 to 1,000 trees in a day. We keep a staff of six or eight labourers to show the lots and assist in measuring the timber, and, a few days before the sale, the whole of them are employed with different parties. Each timber merchant requires two assistants; one carries a long pole marked in feet, and the other a leather strap, which indicates the side of the square. In going to work, the man with the pole declares the height of the tree in feet; the man with the strap the side of the square in inches; and the timber merchant refers to his sliding rule for the contents. The measurer has to allow an inch, and sometimes more, for the taper of the tree from where the girth is taken, to the centre of the portion he is measuring. Of course, this is measuring with a centre girth; but an experienced measurer never goes higher than half the circumference of the butt, and adds the number of feet he considers the tree contains above that point. All these things are puzzling to a beginner, but it is astonishing how accurate an old practitioner's work is. Some contend, says Mr. A. Peebles, in the "*Arboricultural Society's Transactions*," that it is impossible to give an approximation of the contents of growing timber by means of a pole and strap. They argue that an experienced judgment and practised eye are more to be depended upon. If those using the pole and strap were to discard the eye and judgment, there might be some force in this reasoning, but as they do not, the whole argument falls to the ground. I speak from experience when I assert that there is seldom a difference of 5 per cent. in the measurements of the various purchasers, and when the lots are afterwards tested, most of them are actually within 5 per cent. of the truth.

NEW HYBRID AUCUBAS.

SEVERAL years have elapsed since I offered a few suggestions regarding the best means of improving the *Aucuba japonica*. At that period little more than theoretical knowledge was at our command, and it was only the hybridist who could with confidence predict that great success was in store for those who were prepared to work with patience and judgment. Contrary to the reasonable hope that by this time the ornamental capabilities of this beautiful shrub would have been largely developed, apparently but little advance has been made either by nurserymen or amateurs to improve the fine properties of the *Aucuba*, which is, nevertheless, eventually destined to occupy a prominent position as a table, greenhouse, and border

decoration. Indeed, it may safely be assumed that it will become a formidable rival to Crotons, Dracænas, and other fine-foliaged plants, for even now a few of my choicest productions do not compare unfavourably with the best of them. My present hope is, if possible, to awaken the energies of amateurs by showing them that a satisfactory share of success has attended my own efforts, and by assuring them that they may easily obtain great results. With this object I propose briefly to refer to those varieties from which my early seedlings were raised (some of which are very good); afterwards I shall make a few explanatory remarks, and then conclude with a description of some of my best seedlings. The latter will necessarily be imperfect, because the *Aucuba* requires several years to attain its permanent character, and many of my best productions are very small. My first attempts at seeding were made with *maculata*, *longifolia variegata*, *longifolia aurea variegata*, *salicifolia*, *limbata*, and *longifolia viridis*, fertilised with *picta*, *bicolor*, and *maculata Sieboldii*. The first four-named varieties are still useful, though the rest have long since been discarded to give place to my own seedlings. Many improved varieties might be raised by those who are satisfied to trust to accidental fertilisation by planting a number of plants of *maculata* in a favourable and isolated situation in company with a few highly-coloured male plants. *Salicifolia* merits special notice; its long, narrow, dark green foliage and large scarlet berries, are so attractive as to place it before all other green *Aucubas*; and if, in July, it is root-grafted upon a seedling just below the seed leaves, it will fruit the following spring and form a charming object, possessing the advantage of rarely making a growth below the junction of the graft. Large-leaved varieties are very beautiful and valuable for out-door purposes, but they fruit sparingly, a defect which renders it desirable to encourage medium and small-leaved seedlings, which, if possessing finely-marked foliage and free-fruiting properties, are more suitable for pot culture. Narrow-leaved kinds are so distinct in form, and bear fruit so profusely, as to make it important to induce the increase of this class, though it will require many years before they can come into general notice, on account of the necessity of having to raise them chiefly from green-leaved plants fertilised with the broad-leaved section. As an example of this difficulty I may mention that, having decided to raise coloured seedlings of the *salicifolia* and *longiflora* type, the progress to that end was so tedious that, from about 1,200 berries of narrow-leaved sorts, I have only raised four finely-marked plants of *salicifolia*, and under a score of *longifolia*; but, it may be added that these seedlings possess such distinct and novel properties as amply to reward me for my labour, and this break will probably introduce a highly valuable class. Occasionally *Aucuba* berries contain two seeds; twice, when this has occurred, two plants have germinated, which, in consequence of their close proximity, have become naturally grafted. Taking a hint from this circumstance, I have tried and

succeeded in root-grafting a seedling before it had made a true leaf. The following are such of my seedlings as seem worthy of notice, viz.:—*Viridis caudata*, a dwarf compact-habited plant, with small and slightly caudate leaves; *viridis fasciata*, foliage various, green, dense, obovate, occasionally auriculate, fruit cylindrical and abortive, stem and branches fasciated; *marginato variegata*, foliage small, slightly caudate, irregularly variegated with white on both surfaces of the leaves, has a tendency to become margined; *variegata intermedia*, a fine variegated male; *variegata tricolor*, a very interesting variegated male, showing a curious combination of green, yellow, and creamy-white; as this seedling has only five leaves it will probably improve considerably; *lato-aurea variegata*—I have a fine

male and female specimen of this grand variety, the leaves are large and broad, beautifully marbled with yellow and green; *marmorata aurea*, a fine yellow marmorated male, foliage small; *maculata tricolor*, a male, colours rather indistinct, but will probably serve to produce seedlings of better defined shades; *salicifolia maculata*, female, foliage dark green and yellow, very distinct; *salicifolia maculata* and *marmorata*, three distinctly different and highly promising seedlings; *longifolia maculata* and *marmorata*, six or more new varieties; *longifolia maculata intermedia*, a bold-leaved and promising seedling. During the next month I hope to be able to supply my friends with pollen, of a quality such as they cannot obtain elsewhere, and as it is possible that after their requirements have been met there may still be a small surplus, I shall be most happy to distribute it amongst a few amateurs, if they are disposed to try their hands at fertilisation.

A. CLAPHAM.

Ramsdale Bank, Scarborough.



Ivy in the Botanic Gardens, Montpellier (see p. 263).

Exhausting Effects of Close Pruning.—During the past autumn we saw at Blythefield a very remarkable illustration of the effect of close pruning on the constitution of a plant, as compared with a free extension of growth. In one part of the pleasure grounds was a Hornbeam hedge of considerable age, and about 8 feet high, presenting the usual appearance of a hedge of this kind, the individual trees bearing a multitude of slender twigs. From some cause or other the end tree of this line of Hornbeams had been allowed to grow unmolested,

and while the constantly pruned plants were no thicker than one's wrist, the freely grown tree was a fine umbrageous specimen with a stout trunk, and a head at least 40 feet high. It formed a capital illustration of the truth, that constant repression is exhausting, and the accidental juxtaposition of the hedge and the tree brought out strongly the different effects of the two systems of pruning.—“Florist.”

Preservation of Form in Flowers and Leaves.—A very ingenious application of electro-metallurgy has recently been brought before the notice of the Society of Arts. It consists in the application of a coat of silver, by means of electro-deposition, on natural leaves and flowers. By this means very delicate ornaments are produced, since the precise form and texture of the natural leaf are preserved under the thin silver film. The special process by which these results are obtained is the invention of Mr. Denton.

THE KITCHEN GARDEN.

NOTES ON LAST YEAR'S POTATO CROP.

THE summer of 1874, though generally very favourable to the Potato crop, was not one that suited me. My land (situate in Nottinghamshire), being a light loam with gravelly sub-soil, suffered considerably in such a dry season as the last. From this cause, and the injury done by the frosts in May, especially those of the 17th and 18th, my crop of "earlies" was practically worthless. The following table shows the result of the whole crop:—

	Weight of Seed.		No. of Sets.		Distance apart.		Date of Lifting.	Weight of Crop.
	Whole Sets.	Cut Sets.	Whole.	Cut.	Rows.	Sets.		
	lbs.	lbs.			feet	in.		lbs.
1. Racehorse	3½	—	36	—	2	9	Aug. 5	15½
2. Mona's Pride	7	—	60	—	2	9	Aug. 5	30
3. Ashleaf	7	—	73	—	2	9	Aug. 5	29
4. King of the Earlies	7	—	44	—	4	12	Aug. 5	50
5. Early Rose	7	—	48	—	2½	12	Aug. 12	76½
6. Early Goodrich	3½	—	23	—	2½	12	Aug. 5	11
7. Bresee's Prolific	3½	—	16	—	2½	12	Sept. 3	6
8. Myatt's Ashleaf	7	—	53	—	2½	10	Aug. 5	23
9. Prince of Wales' Kidney	2¾	—	20	—	2½	10	Sept. 5	13
10. Berks Kidney	3½	—	32	—	2½	10	Sept. 5	18½
11. Sedilla	7	—	64	—	2½	12	Sept. 11	58
12. Brailsford's Seedling	4	—	67	—	2½	12	Sept. 12	44
13. Peach Bloom	2½	—	19	—	2½	12	Sept. 12	28
14. Late Rose	6	—	61	—	4	15	Sept. 16	185
15. White Don	6	—	48	—	4	12	Oct. 1	90
16. Harbinger	7	—	68	—	2½	10	Oct. 19	74
17. Oxfordshire Kidney	14	—	103	—	2½	12	Oct. 19	193
18. Queen	6	—	60	—	4	12	Oct. 20	172
19. Model	14	—	69	—	4	15	Oct. 21	162
20. Paterson's Victoria	7	—	51	—	2½	12	Oct. 20	64
21. American Red Seedling... ..	7	7	22	22	4	15	Oct. 30	{ 71½* 72† 119*
22. Red Flake	3	3	21	21	4	15	Oct. 30	{ 97† 142*
23. Red-skinned Flour-ball ..	7	7	38	38	4	15	Oct. 31	{ 142† 160
24. Wood's Scarlet Prolific ...	6	—	38	—	4	15	Oct. 31	

There was no disease, with one exception. Late Rose was lifted in fine dry weather, and came up a very fine, large, and level set without a symptom of disease. They were so inviting that they were taken into use at once, and fortunately; for about three weeks after they were dug disease appeared, and the whole became affected so quickly that in another three weeks it took a peck-basketful to provide a dish for the table. This is the only disease I have had. The whole crop was treated as far as possible in the same way. No manure was used except a light dressing of old stable litter early in the spring. The planting began on March 7th with No. 1, and was continued throughout the list in the order indicated. The "earlies" were planted 5 inches, the "late" 7 inches deep, and, according to my usual practice, none were earthed up, except in two cases for the sake of experiment which has before been tried with a similar result. Twenty-four tubers of equal size and weight were taken of Bresee's King of the Earlies and also of Model, and were planted in one row; twelve of each were earthed up in the usual way, and the other twelve left without any earthing. The twelve earthed up roots of King of the Earlies yielded 13½ lbs.; the remaining twelve, not earthed up, yielded 13½ lbs.; there was, therefore, not much gain in earthing up with these. With Model the difference was greater; the twelve earthed up yielded 26 lbs., the twelve not earthed up 34 lbs. These two varieties were only chosen in preference to others because the seed in each case was so exactly level and very good. As regards whole and cut sets, I have tried many experiments, and I much prefer the whole; with some of the coarse and strong-growing sorts it makes little difference in the yield. Red-skinned Flour-ball in the foregoing table is a curious instance of this, but I believe in all cases the constitution of Potatoes grown from whole sets is stronger than of those from cut sets. Nos. 14, 15, 18, and 24 were new seed, the rest were new in 1873. The superiority of the crop from the new seed (except No. 15, which did not yield as it should have done) is very marked; the more so as the rest were new in 1873, and were grown in 1872 on totally different land in another county. No rule is without an exception—No. 22 was a better crop last year than in 1873. I have above alluded to the principal causes of the failure of the "earlies," and, I may add, not having unlimited room, I am obliged to grow some on a 10-foot border backed by a hedge, which always affects the yield; Nos. 1, 2, 3, 6, 7, 8, 9, 10, and 16 were so grown. W. N.

* Whole sets; † cut sets.

A NEW VEGETABLE.

THE Witloof is the name of a vegetable unknown in France, but which deserves to be used for the table in other countries, as much as it is in Belgium. This vegetable is the head formed by the radical leaves of a peculiar variety of Chicory which has been called the Large-rooted Brussels Chicory. It bears much resemblance to the Magdebourg kind, which, in fact, may be used in the same way; whilst the Brunswick sort is, on the other hand, totally unadapted for the purpose. In Paris, the Barbe de Capucin, which is wild Chicory blanched, is a very common salad plant. Its slender roots, which are seldom thicker than a lead-pencil, terminate in white leaves which attain a length of 7 or 8 inches, or more. In the Witloof, on the contrary, the root is thick and stubby, and carries a head of erect leaves that are stout, thick, and imbricated, forming a small compact head, which reminds one of the heart of a Cos Lettuce. In fact, except as regards whiteness, which is common to both when blanched, the Witloof is in all respects the very opposite of the Barbe de Capucin. The Witloof, unlike that kind, is brought to market deprived of its root, which is cut off a little below the leaves, as is done with the Dandelion. It is extremely tender, and has an agreeable, but slightly bitter flavour, which reminds one of that of Endive. The bitterness of the Barbe de Capucin is not agreeable to every one; but in the Witloof it is less apparent. In Brussels, the heads of the Witloof are cooked whole, and eaten with white or cream sauce; but it is equally good as a salad. It is all the more valuable on account of its being obtainable at a season when other vegetables are comparatively scarce, the markets of Brussels being supplied with it from Christmas till Easter, and later. The seeds of this variety are sown during the first fortnight of June, in good and rather deep garden soil. The only care to be taken is not to crowd the plants too much. The roots should be about 4 inches apart, in order that they may be thoroughly developed, for upon the size of the root the beauty of the head in a great measure depends. From the end of October to that of February a trench, from 3½ to 5 feet wide, and from 8 to 16 inches in depth, is opened in a favourable part of the garden. In the bottom of this trench, after having cut back the leaves to a length of about 2 inches, the roots are planted upright, or very slightly inclined, at a distance of an inch from one another, and in rows about 8 inches apart. Between the roots light soil or compost is placed so that no space may be left, and finally the surface is covered with about 3 or 4 inches of this light soil. The planting is then finished, and the development of the leaves now only depends upon the heat applied. The system of heating adopted in Belgium consists in putting a bed of fresh stable manure, of the thickness of from 2 to 3 feet, over the plants. This, perhaps, is a somewhat primitive and expensive method of forcing, as by it a large quantity of manure is required and much trouble involved; for example, it is necessary to cover the manure with planks to protect it from heavy rains, and it is quite possible that less costly methods of treatment might easily be discovered. However this may be, if the heat be sufficient the heads are fit for cutting a month or six weeks after it is applied, and will then measure from 3½ to 6½ inches in height by 1 to 2 inches in diameter. The heads are cut before the leaves reach the manure, in fact, when they are an inch or two from it, and this saves them from being embrowned and spoilt. The word Witloof means literally "White leaf."—"Journal de la Société Centrale d'Horticulture."

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Why Cucumbers are Bitter.—One of the causes which gardeners give for Cucumbers being bitter is slow growth. In order to secure sweetness and crispness, they say that they should be forced to grow as fast as possible.—B.

Forced Rhubarb in the Market.—It may not be generally known that large quantities of the early Rhubarb in our London markets come from Yorkshire. It is forced by the warmth of the waste water from the boilers of the factories in the neighbourhood of Leeds and Bradford, and has become a useful vegetable in January and February.—W. A.

Preserving Broccoli from Frost.—It is well known that Early Winter Broccoli often suffers severely from the effects of frost, and sometimes whole plantations become irremediably injured. One plan, says the "Florist," of preserving Broccoli is to pull them up by the roots as soon as they turn in ready for use, and to suspend them from the roof in an airy shed till wanted. By adopting this means they are preserved from injury from frost, or from rotting through exposure to heavy and continuous rains; and they remain fit for table use for eight or ten weeks.

Veitch's Dwarf-curbed Borecole or Kale.—After a long and somewhat severe winter, it is pleasant to say that this vegetable has been proved to be entirely frost-proof; and, although in ordinary winters when Broccoli and Cabbage are abundant, we are too apt to despise the more humble Kale, yet I doubt not that during the last few months the value of this excellent vegetable has made itself well-known to many. Its large leaves are quite equal, if not superior, to any kind of garnishing for large dishes in mid-winter. The crown is also an excellent dish, while the young sprouts in spring are equal, if not superior, to any green vegetable that is grown.—JAMES GROOM, Henham.

BURNING LIME IN A PIT.

LIME may be burned without a kiln by laying a foundation of blocks of stone, covered in such a manner as to make draft passages to the centre of a round heap of say 12 feet in diameter. The form of the foundation is shown in fig. 1, and the manner of making the draft-flue is shown in fig. 2. The draft-flues are filled with dry kindling-wood, a layer of coal-slack 3 inches thick spread over the foundation, and a layer of limestone 12 inches thick placed upon the slack; then a layer of slack, then limestone, and so on alternately, until a heap is made like that shown in fig. 2. This is covered with leaves, sods, or coarse manure and litter 12 inches thick, and then with earth for 6 or 8 inches. In the centre of the heap, as it is built up, a chimney about a foot in diameter is left, and this is filled with kindling wood and slack. When all is ready, the top of the chimney being left open, the fuel is kindled. When well on fire, the chimney is closed by throwing limestone in it until filled, and then covering it with leaves or litter and earth. The fire is made to burn gently by regulating the draft-holes, which should be closed with pieces of limestone covered with earth, and only one or two kept partially open to draw the fire to the side where it is wanted. In short, the fire should be managed exactly as that of a charcoal pit, except that a greater heat is needed. As the pit sinks down, earth and leaves, or litter, should be thrown over the cracks, lest the fire become too strong. In about a week the lime will be burned, when the draft-holes may be closed and the heap left to cool. Then the earth is

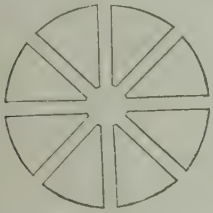


Fig. 1. Foundation of Heap.

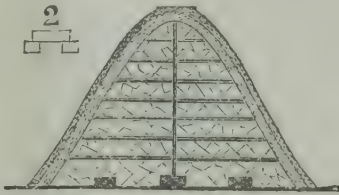


Fig. 2. Heap ready for burning, and plan of draft-flue.

raked off, and the partly-burned stone from the outside laid on one side for another pit, and the lime may be removed. By this method (says the "New York Tribune") forty loads of lime (1,000 bushels) may be burned with six loads of coal-slack and one cord of wood. The lime thus obtained should not cost over 5 or 6 cents a bushel.

VOX NATURÆ.

Low heard the river reeds among
The wind responds with whisper'd sigh,
To that sweet chant by wavelets sung,
As onward to the marge they hie.
Or, roaring thro' the forest blown
Till branch with branch is interlock'd,
The north makes all the woodland moan
In rude embrace unceasing rock'd.
Who would not own the magic spell
To probe the purport of the breeze,
To glean what zephyrs soft would tell
When gone a-wooing 'mong the trees?
What means the fond confession made
By airy sighs in even's ear,
What message breathes from shade to shade
In ev'ry rustle that we hear?
Doth Brake to Briar its tidings send,
Doth leaf with leaf a converse hold,
When breezes thro' the upland wend
And die again along the wold?
Mayhap we view an angry strife
'Twixt Oak and Ash, 'twixt Beech and Elm,
And envy mars the sylvan life
When storms, we think, the woods o'erwhelm.
Such fancies stir the dreaming mood
Of worshippers at Nature's shrine,
And add a charm to solitude,
Amid her mysteries divine;
When clearer to the sense reveal'd
Comes all her varied utterance,
And what to dullard ears is sealed
Makes eloquent the poet's trance.
Be ours the hearing thrice refined
The eye with inner sight endow'd
To catch the voices of the wind,
And shape the changes of the cloud.

—"All the Year Round."

GARDENING FOR THE WEEK.

Indoor Fruit Department.

Vines.—Young Vines must be treated very carefully about this time, as much of their future success depends on a good start. As soon as the growths of early cut-back plants are 3 feet long they may be shifted into 10 and 12-inch pots. These are very suitable, and quite large enough for all fruiting canes. Any which may have been plunged up to the time of potting should have no such treatment afterwards, as it is much better never to encourage the young roots with bottom-heat. Three inches of broken crocks must be placed in the bottom of each pot for drainage, and the round bits of turf may be laid with advantage over the surface, before putting in any fine soil. It is of much importance that the soil used for potting should consist of the best fibrous loam, and, as bone meal is the most nutritious matter which can be used as a manure, an 8-inch potful may be added to every barrowload of loam. In potting, the ball should be well let down into the pot, so that the base of the young shoot is covered when the soil is filled in to within half a finger's length of the rim of the pot. When this is done many new roots are emitted from the stem, which otherwise have no chance of existing. Where it is convenient the newly-potted plants may at once be set in the position they are to hold throughout the season, and much trouble in shifting large heavy pots will be avoided. The back wall of a Pine-stove, or a similar position where the sun's rays have free access, is the place where they are most certain of arriving at a perfect maturity. As soon as they are put in position, each ball must be moistened with water through a fine rose, and little more should be given until the plant shows signs of growing. The foliage should be sprinkled daily with the syringe, and the atmosphere may be kept humid, with a temperature of not less than 65°. Keep the surface soil in young Vine eye pots well stirred up, taking care, however, not to injure any of the rootlets which may happen to be quartered about the surface. Barbarossa, Syrian, and other free-growing kinds may be in advance of other sorts. As each produces a healthy shoot about 12 inches high it should be removed from the influence of bottom-heat.

Pines.—Where a constant succession of Pine fruit is kept up, Smooths and other sorts should be in readiness to come in after the Queens. This cannot be brought about in a few days or weeks, unless the plants have been in preparation throughout the winter, when little difficulty will be experienced in causing a few of them to show by a few degrees of more heat. Plants for late autumn fruiting may be kept growing in a temperature of 70° at night, with 10° more by day, before admitting air. Air may also be given to those plants potted recently, when the thermometer indicates the heat I have mentioned above. The ventilators should be closed early, so as to shut in as much sun-heat as possible; much fire-heat may be dispensed with if attention be paid to this. Do not keep the atmosphere about Queens saturated with moisture, or long unsightly crowns will be the result. A syringing overhead at shutting-up time, and the moisture derived from the evaporating troughs, are generally sufficient.—J. MUIR.

Hardy Fruit.

At length there are indications of the approach of spring, which will be all the more welcome after the past winter, which, if not very severe, has been an unusually long one; and it is satisfactory to find that hardy fruit trees have not suffered, but that there is promise of abundance of fruits of all kinds, and the season being so late is all in favour of the trees escaping injury to their young and tender foliage by cold north-east winds, generally so prevalent at the end of this month. Apricots are just opening their flowers, which this year are very fine, and tell plainly that the tropical heat of last summer suited them, where (as was the case with us) plenty of water could be given them. Peaches are later, but both should be covered up at night, and also during the day when the sun is powerful. Pears are also ready to burst their buds, and the first warm day will bring many kinds into full blossom. If requisite, these can be easily protected with tiffany thrown loosely over them. For cordons and espaliers this is the very best protection; but dwarf bushes or pyramids are best protected by shaking dry hay over the trees. The birds, especially bullfinches, have been very busy among the buds, and the gun has been brought into requisition again; for, after trying all other known remedies, this is found to be the only effectual one. The season for grafting having arrived this should be effected without loss of time; the best method is what is called cleft or wedge grafting—the name of which expresses the nature of the operation. If the grafts or scions were cut and healed in as previously advised, they will now be in good condition for use. After the insertion of the grafts there is nothing better for the exclusion of air than the old-fashioned plan of moulding clay with the hand, care being taken to have it thoroughly adhesive, so that it may not be washed off with the rain. Newly planted trees will be likely to suffer from the

drying winds so general at this season, as a remedy against which I repeat my advice to mulch. There is nothing that more effectually saves vegetable life; watering is not to be compared to it; indeed, it is seldom required if mulching be attended to so soon as the trees are planted. Strawberry beds should have ordinary stable litter applied to them at once; its manurial properties will then be washed into the ground and prove of great assistance to the crop, whilst the straw will remain to keep the fruit clean, and is much better and neater than new straw put on at the time of ripening.—W. WILD-SMITH, *Heckfield*.

Flower Garden and Pleasure Grounds.

It is not, perhaps, possible to produce, by means of spring-flowering plants alone, that simultaneous and continuous display of richly-coloured flowers and ornamental foliage which it is easy enough to accomplish in the case of summer-bedding plants at a more advanced period of the year. But, nevertheless, from the present time until about the last week in May, or later, did circumstances permit, a display of considerable beauty and of great interest may be furnished by the use of spring-flowering plants and early bulbs of various sorts. About the time mentioned, viz., the end of May, such plants must necessarily be removed to the reserve garden or elsewhere, to set the beds at liberty for summer-bedding plants; and the present season has been by no means conducive to an early production of flowers. But with improvement in the state of the weather, development in their case may now be expected to be sudden; and, with a view to add as much as possible to their attractiveness, let every part of the garden be kept in the best possible order. Lawns and walks should be frequently swept, in order to remove fallen leaves, worm-casts, &c. Worms are sometimes exceedingly troublesome about this time, and to destroy them, or, at least, to drive them away, use clear lime-water, put on through the rose of a watering-pot. Mowing will soon be required; in some localities, indeed, this is already the case, and it should not be long delayed, as the production of a fine green sward is of the greatest importance, adding, as it does, very materially to the beauty and attraction of the garden. In many garden establishments there is a somewhat interesting appendage, which is known as the hardy Fernery, the rock garden, or the rootery, and which is generally to be found in a somewhat shady and secluded situation. It is usually devoted to the culture of the more hardy kinds of Alpine plants and Ferns; and the wild or wilderness-like character of this department, being so distinct from the monotonous formality of the modern flower garden, is much appreciated by some, as affording a pleasing relief to the dazzling effect produced by the bright colours of what are termed bedding plants. The rock garden may of course contain, in addition to Alpine and other hardy herbaceous plants and hardy Ferns, many dwarf hardy shrubs, such as the *Deutzia gracilis*, *Skimmia japonica*, &c., and such plants as the *Bambusa Fortunei*, and *Yuccas* of various kinds. All such gardens should now receive attention in the way of forking-up and enriching the soil, removing everything in the shape of weeds and litter, and adding fresh soil or compost wherever it may be found necessary. It is always advisable to allow hardy Ferns to have the natural protection of their decaying fronds during the winter months; but these should all be cleared off now, and the surface soil should be refreshed, weeds eradicated, and deficiencies (if any) made good by plants turned out of pots which may have been wintered in pits or frames. In most localities, many interesting varieties of native Ferns may be collected at the present season from woods and hedge-rows, &c., which may, if required, be introduced to this department. The cold drying winds, which we have recently experienced, are very injurious to recently transplanted trees and shrubs, more especially to large-sized evergreens, all of which should have a liberal supply of water now, an application which should be followed by a mulching of manure, in order to prevent, to some extent, evaporation from the soil. It is of the utmost importance to care well for such plants after they have been transplanted until they can form fresh roots; for, if this is not done, the plants frequently get so much injured that a season's growth, at least, is lost, even if the plants should ultimately recover, which is not always the case.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Roses.

Among summer-flowering and climbing varieties may be included the Ayrshire, Boursault, Evergreen, and the Hybrid Bourbon and Chinese Roses, the floral display made by which lasts only about three weeks; but there are other kinds of summer Roses that are not perpetual flowerers, such as the Damask and Gallica classes; among these, such kinds as *Madame Hardy* are, however, well worth growing; it is pure white, and a well formed Rose. Nevertheless, *Boule de Neige*, among the Hybrid Perpetuals, is quite as good as any summer Rose; if, therefore, a good white Rose is required for a

conspicuous situation, I would recommend this Hybrid Perpetual; but if for a shrubbery, or for planting near trees, the summer flowering climbing Roses are best, as they are stronger growers than the Hybrid Perpetuals, and can be trained so as to have a fine appearance. These are the only classes of Roses that require more skill as regards pruning than the Hybrid Perpetuals, with which we may associate the Bourbons, Teas, and Chinas, as well as most of the Noisettes. The latter, indeed, may be termed perpetual flowering climbing Roses, most of them being useful as climbers, and also as pyramid and pole Roses; if pruned so as to leave the shoots long enough for training, these form excellent pyramid or trellis Roses; for, when the points are brought down they flower from every lateral shoot. This applies to *Maréchal Niel*, *Lamarque*, *Desprez*, and *Solfaterre*; but, besides these, there are other varieties of the Noisette class that are not useful for climbers, such as *Triomphe de Rennes* and *Narcisse*, which are more compact growers, and make fine standard or close growing Roses. The Boursault and Ayrshire Roses are all useful in rough situations, as they are free flowering and strong growers, and are quite hardy. In pruning these should be well thinned, leaving, however, enough to cover the pole or trellis. Close pruning they do not require. The Hybrid, China, and Bourbon Roses should be pruned differently; take, for instance, *Charles Lawson*, an excellent Rose for covering lattice work, and it also makes a good standard. Of this I have some two dozen standards, and it also makes a valuable pole Rose. *Miss Ingram* is also equally useful. Hybrid Bourbon *Coup de Hébé* is another excellent Rose; but we have a Hybrid Perpetual nearly equal to it, both in shape and colour, in *Auguste Mie*. Most of the Roses, Hybrid, China, and Bourbon varieties, make very good pole Roses, and many of them are also excellent climbers. Among rosy-blush climbing kinds, one of the best is *Blairii No. 2*; it is good in shape, and valuable for cutting from. *Madame Plantier*, a beautiful white cluster Rose, is also useful for furnishing cut bloom, and is an excellent climber. These may be all pruned in February; in no case do I hold with pruning out-door Roses in November. In very mild weather in December and January the buds start, and the shoots get quite crippled. Hybrid, China, and Bourbons are useful for planting in shrubberies as standards, or in the form of bushes, but I do not recommend many of them to be used as standards, as the Hybrid Perpetuals are better suited for that purpose.—H. S.

Kitchen Garden.

Asparagus.—Many people of limited means are deterred from cultivating Asparagus by erroneous impressions respecting the expense of the preparation of the beds. During the last two or three summers, I have been watching the development of a plant of Asparagus that came up accidentally in the shrubbery—where, as it is, on the whole, rather an ornamental plant, it was allowed to remain. It has never had a particle of manure; but the soil, although not particularly suitable, is of considerable depth, its level having been raised a good many years ago; and to this depth of soil, accompanied by space for development, I attribute its wonderful growth. Asparagus delights in abundant supplies of water; and, in deep, well-drained soils, this might be made to convey nearly all the manure necessary for its successful cultivation, with the exception of mulchings, and occasional sprinklings of salt. I believe there is no occasion to raise the beds into such mounds as are commonly made. A moisture-loving plant, like Asparagus, would do better (except on cold, clay soil), if planted in trenches rather than on mounds, and this system of trench-planting is especially adapted for poor, light, sandy soils, as it offers such facilities for easily flooding the plants with water. In making new plantations, whether the old bed system, with its elaborate preparation (and I have no desire to find particular fault with it) be adopted or not healthy plants from one to two years old are the best for planting; and the most suitable time is just after growth has commenced, usually in April. Where many roots are required for forcing, I should certainly recommend it to be grown in single rows, not less than two feet apart from each other, and at least 1 foot apart in the rows. The way to secure fine produce is to encourage individual growth by allowing each plant plenty of space for development; this is more profitable than thick planting, where a continual struggle for existence must be going on. It is best to raise a bed of seedlings every year sufficient to make a new plantation to take the place of that removed for forcing, or rather to come on in succession. In planting, make a drill or trench wide enough to receive the roots without cramping them, cover with 2 inches of fine light soil, and water abundantly in dry weather, giving sewage or liquid manure whenever possible. When taking up the roots allow as little exposure to the air as possible, to avoid giving too much check. Early Cauliflowers under hand-lights should be earthed up, and watered with liquid manure, and have as much air as can be given

without unduly checking growth; a brick might be put under the edge of the glasses on the south side, and the top ventilators moved a little; but the weather here still continues severe, although probably we are not far from a change. All forced vegetables, such as Potatoes, Carrots, Turnips, Lettuce, and all kinds of salading, must have sufficient tepid water given to keep the soil in a healthy state, as regards moisture; an exception should, however, be made in the case of Potatoes that have completed their growth. From a pound to a pound and a half of guano to 36 gallons of water makes a cleanly and very serviceable mixture, suitable for most plants in robust health, but such strong stimulants are often worse than wasted upon weak spindly plants, from the latter not having the power to take up and assimilate what is given to them. If there is a demand for Parsley roots at any time in the kitchen, a row or two of the *Hamburgh Parsley* should be sown now, and be well thinned out when large enough. *Borage* is often required in some establishments, and should be sown at once. There is one peculiarity about this plant; if it once goes to seed in a place, it will keep coming up for several years; I have not sown any for years, and we always have plenty. It is rather a pretty plant for back shrubbery borders, and bees are very fond of it; as this is at present a backward season, a few plants might be pushed on in heat. *Balm* and *Sweet Verbena* are usually used in conjunction with it for flavouring claret-cup; they also should be forwarded in heat, as required. Renew or increase plantations of *Sorrel*, by dividing the roots and planting them in rows a foot apart each way. *Fennel* may be sown now, and thinned out or transplanted when large enough. To ensure a supply of green *Mint* at all seasons, it is best to make new plantations frequently; for example, at the present time, plant a bed under a north wall, another patch in the same position towards mid-summer, and again later on towards the end of the summer, in a warm sheltered spot. If the latter does not yield a picking in the winter, it will very early in the spring, and save much forcing. If the long creeping roots are cut into short pieces, and planted in rows with a trowel or dibble, the thing is soon done.—E. HOBDAI, *Ramsey Abbey*.

SUNKEN BOILERS.

If there be one subject on which I should have expected all gardeners to be agreed it would have been that of the advantage of a good rise from the boiler to the pipes, for a young gardener soon becomes acquainted with the stokehole, and the impressions then formed are often not readily effaced. He must make a poor use of his time, if he does not come to a conclusion as to what form of boiler and arrangement of pipes carry the heat most speedily and effectually to its destination. My own experience fully bears out the remark of your correspondent, Mr. R. S. Dunbar, that, unless there is a good rise from the boiler, there must be a great waste of fuel in forcing the water along dead-levels, and that however much boilers or pipes may be altered and improved, the laws regulating the circulation of water will remain the same—the hottest water will still flow upward, as naturally as smoke from the furnace, and although it may be forced to take an opposite direction, it is contrary to reason to suppose that it will circulate as speedily or effectually as if it were allowed to travel uninterruptedly. A boiler must be able to do its work easily, if it is to do it well. With regard to the form of boiler, I am of opinion that the tubular, or a combination of the tubular and saddle, is as good a form as can be desired; but so much depends on the setting, arrangement of pipes, and, perhaps above everything, upon the stoking, that it would be hard to decide between the rival claims to superiority; nor does it affect the present question. Nearly every form of boiler that I have yet met with is good, if intelligently used; but many are so fixed that they work under difficulties; and, consequently, they do not give the satisfaction they ought. If it were left to the gardener, who is to be held responsible for the working of it, and to the hot-water engineer and his assistants, who are to fix it, the right boiler would generally be put in the right place; but too often others, with more influence, but less knowledge of what is required, are consulted, and such alterations are made as ruin the whole affair. I believe that amateurs are the greatest sufferers from purchasing boilers that are advertised to do more work than they are able—the most expensive of all kinds of economy, and one that generally ends in the remodelling of the entire apparatus being rendered necessary. I am confident that it is more economical, as regards fuel, to have rather too much than too little of boiler power and pipe surface. I do not see the slightest reason why it should be more difficult to keep water out of stokeholes than to retain it in cemented tanks, which may be seen in all gardens of any size; but I can see the most weighty reasons why a position where such precautions are necessary, should be avoided altogether for forcing houses for Vines, Peaches, &c., which must be planted in borders (usually below the level of the pipes), and which, as they are in full growth in early spring when the

water would be highest, would be more likely to suffer at the root from moisture than the stokehole. Any good bricklayer could keep the water out, as one coat of cement ought to last as long as the boiler, and in the worst cases, even for tanks for heating water almost to the boiling point, a easing of flat tiles, in addition to the cement, will make it hold or keep out water as well as an iron tank.

Henham Gardens.

JAMES GROOM.

I have just completed a new *Vinery*, and having to contend with the difficulty of which some of your correspondents complain, I placed the heating in the hands of a hot-water engineer at *Macclesfield*, who at once relieved me by putting in one of his boilers, which require no sinking. The level of the flow is some three feet below the crown of the boiler (a vertical tubular one), and its action, which has been all that could be desired, has been fully proved during the late severe weather. Having had the boiler and pipes filled (to prove the joints) before the roof was glazed, and having no means of carrying the water away if I had run it off on the setting in of the frost, I was compelled to begin firing, and, though in the open air, the pipes were kept quite hot during the whole time the frost lasted, and stoking was only required at intervals of twelve hours or thereabouts.

HUGH FORD.

43, *Park Green, Macclesfield.*

I was pleased to see Mr. Dunbar's practical reply to Messrs. Williams and Hobday on this subject, and must say that my experience fully coincides with his. While I admit that it is possible for an apparatus like Mr. Williams's to work, provided it has the pipes at about the same level from the foot of the upright syphon pipes till the return enters the boiler, the necessity for the large expansion pipe clearly shows that a great deal of extra power is required to make the water circulate in the apparatus, as the cold water in the level return pipe will not run in the boiler until it is forced by the pressure of the almost boiling water from above. On the other hand, in an ordinary apparatus, with the boiler sunk below its work, the water, the moment it becomes the least warm, circulates at once, because the cold water in the return, being heavier, falls naturally down into the boiler. In the early days of hot-water heating, an engineer invented a valve which made the water circulate through dips in the flow pipes; it worked on the same principles as a hydraulic ram, that is, the water was heated up in the boiler till the pressure became strong enough, when it burst through the valve. The valve then shut again, and retained what it had got, until the cold water, which took the place of what went through the valve, became heated, and the operation was repeated. This was very ingenious in its way, but the principle on which it worked was nearer akin to steam power than that of hot-water circulation; and it appears to me that it is on this same pressure system that Messrs. Williams's and Hobday's apparatus works—without a valve, of course, but still by the pressure. That the same apparatus, with sufficient provision for expansion, would work, even without the upright syphon, was proved by the apparatus shown by Mr. Cowan, at Manchester, in 1873, where the power expended would have been greatly in excess of what was necessary, had the boiler been below its work. About a year ago, I tried an experiment with a powerful boiler, having about 40 feet of 4-inch pipe attached to it, with a dip about 20 feet from the boiler; just before the dip T connections were put on, and a 9-foot flow carried out at right angles to the main pipes, and returned with a syphon into the main return pipe; yet, though the boiler was fired hard for two days, the water would not go down the dip, but circulated very fast through the side pipes, clearly showing that, even with great pressure, water will not go past a dip, if it can circulate without doing so. It is, I think, rather hasty to jump to the conclusion that it is needless to sink a boiler below its work because of Mr. Williams's apparatus acting without being sunk; for I am afraid it would not act in any case where more than one house was connected to the main supply pipes, as the surface pipes would be on a higher level. As regards Mr. Hobday's apparatus (see page 252), it is quite possible for it to work as described if the pipes are arranged in a particular way, especially if the boiler is an upright one, as in that case, though the flow goes down 18 inches or so, on leaving the boiler, it may still be considerably above the point at which the return enters it, and with the assistance of the 3-inch expansion pipe, in which the perpendicular pressure will be pretty strong, it may work well enough with a powerful boiler. With reference to the dips in the pipes, of which Mr. Hobday speaks, there are certain conditions in the absence of which no hot-water apparatus will work, but if these conditions are attended to (no matter in what way), the apparatus will work; this being the case, it is quite impossible for anyone to give a decided opinion regarding any apparatus without first seeing it. The fact still remains, however, that it is much

better, and in most cases necessary, that a boiler should be below its work. As I expect to be in Ramsey shortly, I will, with Mr. Hobday's kind permission, take the opportunity of seeing the apparatus, and should I find that I am wrong with regard to any of the statements I have made, I shall be only too glad to acknowledge my error, being anxious to hear of anything new and meritorious in hot-water heating. In conclusion, I may say that most hot-water heating engineers are just as anxious to find out any improvement upon the present system as anyone else can be, and, generally speaking, have much greater opportunities of doing so by means of experiments. Heating by hot water is a rather intricate affair, and can only be thoroughly understood after long and careful practical study; so that anyone trying to get an apparatus to work without sinking the boiler need not be astonished to find that it will not act, owing to some slight difference from Mr. Williams's apparatus which one would not expect to alter the result.

AQUA-CALIDA.

Mr. H. Ormson has lately called at our office with drawings and models of a boiler which will shortly be made public, and the special feature of which is, that it can be placed in position without any stoke-hole whatever.

Mole Catching.—Never trap for moles where they work, but select the side of a footpath or gateway, where they have shallow runs. Rub your trap well with a dead mole, and use the old wooden trap with a spitter or bent spring. If the mole works by the trap, open his road a foot each way, rubbing the same with a dead one; peg or pile the run on each side with small sticks, and lay a turf gently over them, keeping out the light, a plan which I have never found to fail. Moles run chiefly in March. I have frequently watched the trap-spring, and have taken seven and eight out of one run. Moles, although troublesome in gardens, ought not to be extirpated in fields or pastures; they live upon the larvæ and pupæ of insects, especially wireworms, which fall into their burrows, and also field mice.—H. R. H.

The Colorado Beetle.—The Colorado Beetle, Dr. George Lawson, a learned professor, of Halifax, Nova Scotia, asserts is not likely to live, or at least to thrive in our climate. We have already indicated as much ourselves, but the professor tells us that the much-dreaded pest is quite unknown among the Bluenoses, the summer climate of the colony being so moist and cool that several other insects, that are troublesome in inland regions on the same parallel, are unknown there; and for a similar reason, although suitable conditions for the propagation of the *Doryphora* may be found in central Europe, it is not likely to establish itself permanently in the British Isles. A hot and dry Continental climate seems to be necessary for its development, its possibility of existence depending upon the degree and continuance of summer heat. Indeed, from his own knowledge, the professor asserts that for the last two or three years numbers of Colorado beetles have been sent to England in produce from all parts of the American Continent, it being absolutely impossible, he says, to pack up any kind of produce without their getting into it; and if even a few of these had survived, one or more of our lynx-eyed bug-hunters would have been shouting pæans over the discovery of a rare species in some entomological magazine or meeting.—“Iron.”

The Enclosure Commission Report.—The report for 1874 states that the acreage of enclosures confirmed since the passing of the Act is 587,867 acres, and the estimated acreage of enclosures in progress is 83,868. Of the 587,867 acres in confirmed enclosures, the number from which public allotments would be required by the commissioners is 414,046, and the extent set out as public allotment for exercise and recreation, and for gardens for the labouring poor, is as follows, viz.:—For exercise and recreation, 1,746 acres; for the labouring poor, 2,183. The commissioners state that they have felt it their duty to discourage fresh applications for enclosure pending the decision of Parliament on the conditions upon which sanction shall in future be given to further enclosures of waste land. The return, printed by order of the House of Commons last year, affords (they add) the most trustworthy data we have yet possessed regarding the extent of common lands still unenclosed. It is there shown to be about one-fourteenth of the entire surface of England and Wales, being 2,632,772 acres in extent. Two-thirds of this are in the mountainous and more elevated districts of the country, and one-third in the lower counties. Adding the apparently cultivable and “common field” lands together, there would seem to be more than one million acres still available for improvement, and for extending the productive area of the country. And much of the high land, though unsuitable for cultivation, might be greatly improved for pasturage or plantations, if released from common rights and held in severality.

NOTES AND QUESTIONS—VARIOUS.

Mice Destroying Christmas Roses.—Every flower-bud was eaten off each plant of Christmas Roses in my garden last winter by mice, and thus an important source of cheerfulness during the winter season was destroyed. I never knew this happen before. Can anyone suggest a protection, failing the evident one of killing all the mice.—SALMONICRIPS.

Eupatorium ageratoides.—This will before long become a general favourite with all who force flowers for the ornamentation of the conservatory in spring, and for cutting for house decoration, for few plants are more easy to grow and flower. Its beautiful white blooms are profusely produced, and, being on moderately long foot-stalks, they are of additional value for bouquets and for the decoration of vases. A large plant of it when well trained is a splendid sight.—N. H. P.

Elæagnus japonica variegata.—This, and its variety *aurea marginata*, has proved perfectly hardy here this winter, withstanding the severity of the weather without the slightest injury. Taking into consideration their free habits of growth and distinctly variegated foliage, these are likely to prove valuable for relieving the general monotony and sombre appearance of our shrubberies. They are amongst the most ornamental shrubs of recent introduction.—GEO. WESTLAND, *Witley Court*.

The Dwarf Daffodil.—I saw this small early-blooming *Narcissus* a day or two since in an old cottage garden in the village of Heckfield, and not having seen it before it was an agreeable surprise. The flowers are pale yellow, trumpet-shaped, and single, growing to a height of 6 inches in a thick cluster, foliage proportionately small. It is evidently the earliest to flower of all the family, and is charming for pots in the hardy plant house. As seen by me, with clumps of *Scilla siberica* and *bifolia*, it was very beautiful.—A. D.

Hardiness of different Laurels.—Mr. Hutchison, of Carlrowie, speaking of the effects of the past winter, says it is a noticeable fact that the Caucasian variety of the Cherry Laurel has proved much harder than the common kind, while the Colchic variety, with its handsome narrow-shaped leaves, of paler green, have suffered most of all. The common Portugal Laurel (*Prunus lusitanica*) has been very much browned, and in many places is now shedding its leaves; and some of the young wood on the more exposed portions of the plant has been killed.

Cyclamens for Table Decoration.—It may be useful to many to learn that plants of *Cyclamen persicum* will bear being turned out of their pots, when in full bloom, and will last without flagging in a saucer or soup-plate for a week at least, provided their roots are kept damp. I lately arranged four groups of these plants in flat dishes on a long side-board, which had a tall back of looking-glass; from these floral bases sprang three slender brass-wire arches, which were lightly draped with climbing Fig (*Ficus repens*), from a hot-house, and the effect was very pleasing.—W. T. P.

The Venetian Sumach (*Rhus Cotinus*).—Few hardy deciduous shrubs are so ornamental and useful as this in August and September, either in the shrubbery or for cut flowers in dinner-table decorations. The flowers, which are red, shading to green on the under side, are more delicate than the finest ostrich feathers, and are very beautiful when spangled with the morning dew. I have used it most successfully in competition at exhibitions for table decorations; it also sells readily in Covent Garden. The plant only requires ordinary culture, but seems much less grown than it deserves to be.—JOHN GARLAND, *Killerton, Exeter*.

Dis-rooting Camellias.—May I ask Mr. Gadd if the plants he so fearlessly denuded of roots, many of which were as thick as one's arm, were previously cut down, or in what proportion the top was to the roots when so treated? I have had an extensive practice with Camellias in various forms, and have frequently cut down old plants which were planted out, allowing them to break previously to lifting and shortening back the roots. By this method they have invariably done well; but to suppose that plants with such roots as have been mentioned, without previous preparation, should be so treated, seems to me absurd. I also look upon good feeding, under such circumstances, as decidedly inimical to root formation.—IGNORAMUS.

Primroses for the Greenhouse.—The following Primroses are excellent for conservatory decoration:—*P. denticulata*, one of the earliest; *P. purpurea*, *P. marginata*, *P. erosa* (Fortunei), *P. nivalis*, and *P. helvetica*, all very attractive. *P. verticillata*, sweet scented, and a capital species. *P. japonica* is better than any of its varieties; it stands forcing well if kept close to the glass and in a temperature of about 55°. The same remark applies to *P. cortusoides* and *P. c. amœna*, which is also better than most of its varieties. There is a white variety of the old *cortusoides* sold for the true *amœna alba*, which I have found somewhat difficult to procure true. The double varieties of *P. acaulis* are worth growing in pots; *P. a. auriculiflora* is a very fine pot sort.—R. P. B.

Peach Setting Indoors.—I send you a few branches which will show you the thick way in which the fruit in my early Peach-house has set. About the middle of January, when the trees came into full flower, with the exception of watering the borders when the soft-water cisterns got full, and during the sunless days of January and February, general damping of the pathways was discontinued until I could perceive that the fruit was well set. I made no attempt at artificial setting, but on three occasions, and upon three of the brightest days at the end of January and beginning of February, I had the house and trees thoroughly syringed—twice in January about eleven o'clock in the forenoon, and the last time in February at one o'clock in the afternoon. This has been my practice for setting Peaches for several years. Out of this house I gathered 1,000 Peaches, besides Nectarines, last season.—J. MILLER, *Clumber*. [The branches of both Peaches and Nectarines sent were in excellent condition, and loaded with fruit.]

Cut Sprays of *Centradenia rosea*.—A failing of *Centradenia rosea* is the way in which it casts its blossoms when brought into the house, and even when in the stove. It is also impatient of the dry atmosphere of a room, where it flags. It has, however, one very valuable quality, viz., when cut, it stands for weeks in water, and for that purpose, and for winter when colour is scarce, it is very effective. Of a large plant, which to tell the truth was infested with bug and condemned to be burnt, I, for experiment, cut off the clean branches, and filled a glass with them, and for a trailer used pieces of the bright green *Testudinaria elephantipes*, or Elephant's foot. Both plants stood six weeks (December and January), and for three of these in a room without a fire during the extremely cold weather we had then. Not a leaf was shed, which surprised me exceedingly; and we are now striking a good stock to cut from next winter. *C. floribunda* and *C. grandiflora* are both worth growing, the one for its peculiar stem, and the way in which the leaves are attached; and the other for its broader leaves and larger blossoms; but *C. rosea* shows the dark red underside of its leaves (a great point for winter glasses) better than these two last-named kinds.—F. J. HOPK, *Wardie Lodge*.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE MOUNTAIN HAREBELLS.

WERE there no Alpine flowers but these, the hills and high rocks would yet be adorned with great loveliness of colour and airy grace of form. The woods, meadows, copses, and high treeless pastures of northern lands are everywhere gay with the Blue Bells of the larger species. Long after the blossoms of these are waving among the long early summer Grass, the higher Alpine kinds rest under the snow, impatient to unfold every tiny shoot that forms their tufted carpet, having the small dark bells folded up in its heart. Then when the snow dissolves from the worn stem and long-buried verdure, every shoot quickly unfolds its treasure, and every tuft bears a thousand bells or stars. The earth, recently sad in its snowy pallor, is now robed with varied blue—near us, around our feet everywhere, yet pure, and soft, and perfect as the hue of the deep sky overhead. And not only on sweet wide Alpine pastures, or in sunny hill copses, or sheltered hedgerows, or high snow-clad ranges, or lowland well-watered meadows is their soft beauty seen; in all these there is abundant plant-food and water; but it is the office of the mountain Harebells, also, to embellish the arid sun-burnt slopes of wasted earthless rock that sometimes form such vast walls about the southern feet of the great mountain ranges. Here, from crevices in the hard rock, from which the roots cannot be extricated, small Harebells spread forth graceful mantles of green, which in spring become as gaily jewelled with flowers as the kinds that live richly on the deep moraine gravel or soft mountain meadow-loam. The smaller Harebells creep down to the hot shores of the Mediterranean to stain with blue the hard rocks washed by its wave; and not content with the precipice, Alpine lawn, or other natural surface, these hardy children of the rocks invade the domain of man. In a two days' journey up one of the most varied, and, as regards its flora, the most interesting of the valleys of the Maritime Alps the writer and Mr. M. Moggridge saw nothing more beautiful than the curtains and tufts and seams of blue-purple of a Harebell, which had taken possession of the dry and by no means old walls of a bridge and its approaches. In the pleasant gardens of Western Europe, nothing is easier than to enjoy the loveliness of these flowers, and by the exercise of a little judgment they may be made to look almost as charming as in their wild state. The taller and medium-sized kinds are happy and long-lived in our garden borders, where, however staked and stiff, they are not very attractive when the full glory of bloom is past. A good many of these kinds may be naturalised in half-wild spots in woods and pleasure-grounds and by shaded Grass walks; in such positions the effect is very beautiful when the pyramidal fountains of blue Harebells appear above the long Grass and other herbs in such positions. I shall long remember the surpassing loveliness of a large tuft of Rampion, accidentally naturalised among wild Ferns and Briars, beside a Grass walk in Professor Owen's garden at Sheen, and which, wholly uncared for, of course, annually sent up showers of the loveliest Blue Bells, and formed by itself a little picture equal to anything elaborated with care and expense in gardens. The smaller kinds may also be frequently naturalised with ease. Old walls are welcome dwelling places for the species that abound on dry rocks in a wild state; wherever underlying rock crops up naturally a number of beautiful species may be naturalised. Our common English Harebell, and other nearly allied kinds, thrive and flower freely, though in a very dwarf state, among Grass that is frequently mown. In the rock garden all the mountain Harebells are easy of culture, and such few of them as may perish on the level ground in heavy soils endure long in dry crevices of rock; some of them like *C. fragilis* and *C. garganica*, have, when planted on dry vertical faces of rock, a habit of growing equally in all directions, pressing their star-laden shoots firmly against the inequalities of the rocks, and frequently flowering and extending themselves thus for months, the shoots (which do not cling or creep) never showing a tendency

to fall wearied from the rocks. Erect flowering kinds, whose shoots do not spread freely in this manner, like the beautiful *C. Pulla* and *C. Raineri*, are best on the more level spots, or on ledges of loamy soil, where they may spread into wide cushions. A number of interesting dwarf kinds, like the Carpathian Harebell and its varieties, and *C. turbinata*, thrive in ordinary soil in borders, forming pretty edgings, or looking better still in tufts on the margins or borders of hardy flowers.

GRAFTING APPLE AND PEAR TREES.

THE season for grafting having arrived, such fruits as Pears and Apples, that have proved unsuitable for the particular district in which they were planted, or that are considered unsatisfactory varieties, may now be headed down, and re-grafted with more valuable kinds, or with those that are better adapted to the locality. Amateur cultivators of fruits must, on looking over the lists of varieties of Apples and Pears, be often at a loss which to select, and many have doubtless experienced feelings of disappointment to find, after the trees have arrived at a bearing state, that they turn out different from what they expected. Those who grow these for sale are sometimes accused of giving somewhat flattering descriptions of them; yet, if the soil, locality, and aspect in which they are grown, happen to suit them, the merits of the trees may prove not to have been exaggerated. The quality of most kinds of fruit varies greatly with the seasons, and the soil in which they are grown. This is especially the case with Pears. A Pear, that may be faultless when grown in light loam, will be hard, gritty, and comparatively worthless, when grown in stiff soil, although the aspect and other conditions may be the same. *Passe Colmar*, a Pear often condemned as gritty and valueless, is one of the best we have here, and more juicy and luscious than any other that ripens at the same season. This we grow on the Pear stock, in light soil, and on walls having a western aspect. It is somewhat disappointing, after years of patient waiting, to find that a variety which has been planted is unsuited to the locality, and useless as a dessert fruit. When this is the case, it is best to head back at once, and re-graft. This operation may be successfully performed on trees of almost any age or size, and it matters little whether the branches to be operated on are large or small. The only difference is in the manner in which the scion has to be inserted. For large branches, I prefer rind grafting, and if carefully performed the operation rarely fails. The branches should be sawn off in a sloping direction, so as to have the cut face on the underside, to prevent wet lodging on it and rotting the wood before the wound has healed over. The saw-cut should then be made perfectly smooth with a knife, or sharp broad chisel. For rind grafting the scions should be cut flat on one side, beginning about 3 inches from the end, and tapering off gradually, so that the point to be inserted under the bark of the old branches headed back is made very thin. The point of the knife should be drawn through the bark where it is intended to place the scion, so as to allow it to be lifted from the wood before pushing in the graft. This operation can be best performed by cutting a piece of hard wood just the shape of the graft to be inserted. By having this a trifle larger than the scion, and thrusting it under the bark, the graft can be pushed in tightly without any fear of injury. Having inserted a sufficient number of grafts, they should be carefully tied in with soft string or bast matting, and covered with a preparation of clay and cow-dung, a composition which should be mixed in the proportion of two-thirds of the former to one of the latter. Old Pears or Apples operated on in this way soon regain their former size; and many that appear to be growing unsatisfactorily, often become healthy vigorous trees after they have been thus treated. Those of your readers who have inferior kinds of Pears, or more than they require of any of the many autumnal varieties that ripen in quick succession, will do well to head back, and graft with *Joséphine de Malines* and *Bergamotte Esperen*, two of the very best Pears which ripen from February to May, and to which *Ne Plus Meuris*, *Easter Beurré*, and others, that used to be depended on for affording a supply after Christmas, must now give place.

J. SHEPPARD.

NOTES OF THE WEEK.

— THE present spring is considered to be the latest ever known to cultivators in the London district. Fruit trees are very backward, and even the common Sloe, on the 27th of March, had not a trace of bloom on it.

— WE have recently observed on sale in London, the Ochra, a vegetable very popular in many hot countries. The succulent parts of the vegetable are dried; but, when soaked in water, or used in soup, swell and become as good as when fresh gathered.

— FIVE thousand one hundred and fifty-seven persons paid for admission to the Royal Horticultural Society's gardens at South Kensington on Easter Monday, the total amount received at the gates being £42 19s. 6d.

— PECCAN NUTS have recently become more frequent in our fruit shops, and we may take the opportunity of pointing out to lovers of Nuts the claims of this, one of the most delicate, and in every way desirable, of all. The Peccan is much liked in America, where it grows wild in many parts. It is the fruit of *Carya olivæformis*, and may be described as a small well-flavoured Walnut, shaped like an Olive, and with a thin fragile shell.

— AT the Regent's Park Exhibition, held on Wednesday last, a plant of *Anthurium Scherzerianum* was exhibited by Mr. Ward, gardener to F. J. Wilkins, Esq., of Leyton, bearing four enormous spathes, the largest of which measured 5 inches in length, and about 4 inches in breadth. It was not so brilliant in colour as an extremely narrow-spathed variety exhibited by Mr. Williams, of Holloway; but, as regards vigour and size, we have hitherto seen nothing equal to it.

— WELL-GROWN plants of the deep rosy-flowered *Spiræa palmata*, one of the most effective of all the species, and a fit companion for the white-flowered *S. japonica*, have made their appearance in Covent Garden Market during the past week. Last year a splendid specimen of this Meadow-sweet was exhibited at one of the Regent's Park exhibitions, measuring fully 5 feet in height, and 4 feet in diameter, and bearing at least fifty great rosy trusses of bloom.

— MR. H. C. HART, one of the naturalists appointed to the Arctic Expedition, has published a list of the plants found in the Islands of Arran, Galway Bay. From the geographical position and geological construction of these islands, their flora offers some interest. The total number of species hitherto observed on this group is 372, about thirty of which the author claims to have added to those previously known. The luxuriance of the Maiden-hair and other Ferns abounding in the deep fissures of the rocks, and the diminutive forms of many flowering plants on the thin crust of soil covering the rocks in some places, are characteristic features of the flora.

— THE April number of "The Florist" contains coloured plates of Tea Rose Catherine Mermet, and a new Pear named Lucy Grieve. The Rose is undoubtedly one of the finest in its class, and in form reminds one of Gloire de Dijon. The colour is delicate rosy-flesh, with a dash of salmon or buff-yellow in the centre of the flower. It is said to grow best on the Briar stock. Lucy Grieve Pear is above the medium size, and resembles Williams's Bon Chrétien in flavour. The fruit is golden-yellow in colour, shaded and speckled with reddish-russet. It received a first-class certificate at the Royal Horticultural Society's meeting, held on October 23, 1874, at which time we tasted it; it is a Pear of first-rate excellence, ripening in October.

— FROM the recently-issued Report of the Algerian Commission we learn:—"The Banana has made rapid strides, and is now an article of common consumption in that colony; but its cultivation, as yet confined to the environs of the town, might be extended so as to find a market in France, England, and Germany. Dried fruits, such as Almonds, Raisins, and Dates, are also adapted to the climate, and would find a ready sale in France, England, and Austria. Beans and Peas are largely exported, particularly to England. The Arabs have eagerly devoted themselves to their cultivation. The Alfa, which covers the interior plateaux—the sole vegetation of the Sahara—which is to be found also in the south of Spain and Portugal, has always been used in the East for hats, plates, mats, &c., and the Spaniards are very expert in using it for baskets, carpets, &c., while it may also be employed for the seats and backs of chairs. It is likely to be largely used in the manufacture of paper, for, mixed with rags, it gives increased consistency, and mixed with the paste manufactured from wood it corrects its brittleness. It has been successfully tried in England for the latter purpose, and the example has been followed elsewhere. Several English papers are printed on Alfa paper, but it will be necessary to take precautions against the Alfa being exhausted, as has to a great extent happened in Spain. They mention that the Algerian Cork tree is used for saddles, walls of houses, and penholders. Their lightness for this last purpose lessens

the fatigue of writing, and though only introduced into England a year ago, they are beginning to be appreciated here as well as in France.

— THE Bournemouth Winter Garden Company have arranged with contractors for the commencement of their winter garden, which is to be completed within twelve months.

— MR. JOHN DILWYN LLEWELLYN, of Penllergare, has given £1,000 for the purpose of laying out the people's new park at Knapllwyd, which he presented to the town of Swansea about three months ago.

— WE are requested to state, in reference to the Cologne International Horticultural Exhibition, that the ground allotted for planting shrubs for this exhibition is now at the disposal of intending exhibitors, who can at once commence to make use of it. No charge will be made for space.

— THE group of pot Roses, shown in splendid condition, by Mr. George Paul, at the Royal Botanic Gardens, Regent's Park, on last Wednesday, proved—if any proof were wanted—that the Rose may be grown to as great perfection under glass in early spring, as out of doors in the fairest climate in summer.

— IT is stated that it is in contemplation to ask Mr. Ellis Lever, the purchaser of Manley Hall, near Manchester, to consent to the conversion of the house, with the conservatories and grounds, into a winter garden for that city. The idea is to form a limited liability company to carry out the scheme. Manley Hall and grounds comprise an area of 80 acres.

— BLOOMS of the beautiful yellow Tea Rose, Madame Trifle, have been sent to us by Mr. Brush, gardener to Lady Hume Campbell, who states that it is one of the best of the Gloire de Dijon class, and superior to Belle Lyonnaise, being much thicker and firmer in the petals. It is not quite so vigorous as Gloire de Dijon. When forced, it is a rich yellow, as bright as that of Maréchal Niel.

— DEPÔTS are now opened at the Home of Industry, Commercial Street, Spitalfields, and Conference Hall, Mildmay Park, for the supply of the hospitals and missions nearest them. Flowers and fruits of all kinds would be most thankfully welcomed if sent addressed to the Secretary of the Flower Mission, at either of the above depôts, before 11 a.m. on Tuesday and Thursday mornings throughout the season.

— THE April number of the "Botanical Magazine" contains coloured plates of the following new plants:—*Phyllocactus biformis*, a slender-growing Cactus of excellent habit, from Honduras, bearing conspicuous rosy-carmine bell-shaped or tubular flowers; *Pentstemon antirrhinoides*, a shrubby yellow-flowered species from California; *Pyrus prunifolia*, with large white or rosy-tinted Apple-like blossoms and golden-yellow crimson-shaded or rosy-tinted Crab-like fruit; *Masdevallia Peristeria*, a yellow crimson-dotted Orchid from New Granada, closely resembling the green-flowered *M. civilis*, and having the same carrion-like odour; *Fourcroya undulata*, a green-flowered slender-growing plant closely resembling the common *F. Selloa*; *Cyrtoperia sanguinea*, a brown-flowered terrestrial Orchid from the Sikkim Himalayas, having a yellowish-white lip margined with rose, and a dark greenish spur.

— MR. F. L. OLMSTEAD (the designer of the Central Park), writing to us from New York, under date 6th March, says:—"We are still in the middle of winter here, the snow nearly a foot in depth, and our spring will probably be very late." The "Signal Service Review" for the month of January, states that "the weather has, except in the South Atlantic States, been decidedly colder than usual in America, especially from the Missouri Valley to the Middle and Eastern States. Many observers mention it as the coldest month for many years. On Mount Washington the minimum temperature registered 46° below zero on the 27th; at Denver, Col., on the 9th, 29° below, the coldest ever known there."

— THE third and concluding part of Volume XXX. of the "Transactions of the Linnean Society" is entirely occupied by Mr. Bentham's revision of the sub-order Mimoseæ. In his introductory remarks he points out the difference between the values in different cases of the characters on which different classes and genera are founded. Thus he remarks that the genus *Cassia* and the order *Compositæ* resemble each other in these respects—that both are perfectly isolated; the pistil and seeds are uniform in each; the variations in the corolla are scarcely more marked in the one than in the other; and the androecium and fruit present, if anything, more important diversities in *Cassia* than in *Compositæ*; in fact, on purely abstract principles, the latter have as good a claim to be included within the bounds of a single genus, as the former. And yet, because there are 10,000 species of *Compositæ*, and only 350 of *Cassia*, the latter has been almost universally treated as a single genus, while the former is divided into genera varying between 750 and 1,200.

SPRAYS FOR THE HAIR.

THAT natural flowers in the hair have a far more pleasing effect than artificial ones is almost too well known for me to draw attention to. They would be much oftener employed, I have no doubt, were they not apt to flag when not mounted properly, and so the general idea is that they last but a short time fresh when placed in the hair. If, however, a little care be taken with the mounting, they will look quite as fresh at the close as at the beginning of the evening. Blooms for this purpose should always be mounted on wires, and a little damp Moss bound in with the stems to keep them fresh; that is, if the flowers selected have short stems, such as Orchids, Camellias, &c.; but, if the stems be of moderate length, the end of the spray can be inserted in a little glass tube, such as is used for button-hole bouquets (the hook being removed), which can be easily concealed in the coils or braids of the hair. The shape of the sprays change, of course, according to those formed of artificial flowers; but I always like them best of rather a long form, and as light and graceful as possible. At this season, some of the best flowers for this purpose are obtainable; as, for example, Orchids, Camellias, Eucharis, Cyclamens, Hyacinth pips, Lily of the Valley, Roses, Spiræas, Stephanotis, Snowdrops, Azaleas, and many others which space will not allow me to enumerate.



A Floral Wreath for the Hair.

I saw two sprays a few days ago which I admired very much at the time, and I shall endeavour to describe them as they may be useful as a guide to some of your readers. One was composed of a Eucharis, pink Hyacinth pips, blooms of Stephanotis mounted singly, pink Heaths, Lily of the Valley, and foliage; the other of a white Camellia, scarlet Pelargonium pips, Snowdrops, and very small sprays of white Lilac, and Ferns. The flowers in these sprays, save the Eucharis, Lily of the Valley, and Pelargoniums, could not be obtained during the summer months; but there are many others then to take their places, such as Roses, Jasmine, Gardenias, Stephanotis, &c. Blooms of the scarlet Ixia, which are to be obtained during May, rank amongst the most effective of bright scarlet flowers for mounting for this purpose. Ferns, or any other foliage that is used for mixing through the flowers, should be cut from plants that have been grown in a cool house; but there are many leaves and fronds perfectly hardy which work in well in these arrangements.

A. HASSARD.

Fowls and Insects.—A member of the Potomac Fruit Growers' Society speaks of the guinea-fowl and turkey as the best destroyers of noxious insects in gardens and on the farm. We have never seen any bird to exceed quite young turkeys in their active hunt in gardens; and chickens are exceedingly useful—the hen, to prevent scratching, being confined in a coop.

THE INDOOR GARDEN.

A CUCUMBER AND WINTER PLANT HOUSE.

Is it practicable to have a Cucumber and green house combined; the Cucumbers to be grown from April to September, and bedding-out plants from September to April, the latter being on a platform over the Cucumber bed? About what width should the house be, and would a double flue answer—that is, a flue with two branches, running along each side of the house into one chimney? I have a quantity of bricks, and also fuel.—JUNIUS.

[Your correspondent will find no difficulty in growing in his house, as he proposes, Cucumbers from April to September, and then devoting it to bedding plants for the winter. He will merely require some ordinary garden frames to accommodate the bedding plants from the commencement of April until the time for bedding-out has arrived. I should recommend a house having an inside measurement of 12 feet in width, and 20 to 30 feet in length, according to the particular requirements of the case. A flue to branch off towards each side as it enters the house, and unite, and enter the chimney-shaft at the other end, will not answer, as it would draw altogether on either one side or the other, or, more probably, not at all. To guard against any escape of gas, the furnace should be built outside the house, and just clear of its wall. Here, also, to regulate the draught, should be fixed a damper. The furnace should stand in a corner at one end, so that the flue from it can enter the house in a straight line, and be carried down one side across the opposite end, and back on the other side to the chimney-shaft, which should stand in the opposite corner to the furnace. The flue should be 9 inches in width inside, and a foot above the ground level, where it enters the house, rising gradually all the way round to where it enters the shaft, at which point it should be 20 inches or 2 feet in height above the ground. A flue so made is certain to draw well, without which, any attempt to heat by this method is useless. Under every joint of the flue-covers should be placed broad strips of stout hoop iron, to prevent the mortar, with which the joints are filled, dropping through. There should be a space of 1 inch between the flue and the outside wall all round, in order to utilise all the heat. The doorway of such a house must be at the end midway between the furnace and the chimney, and should open upon the path down the middle of the house; this path may be 3 feet wide, with a broad shelf overhead to economise space; on each side of the path there should be a 4½-inch brick-built pit, the exterior walls of which should leave an inch space between them and the front of the flue, thus leaving between the pit and the walls of the house all round over the flue a space of 17 or 18 inches. In winter, the temporary stage for the plants can be made to cover this space, as well as the surface of the pit, leaving it a little open, so as to allow the warmth of the flue to ascend when it is required to be used in damp or frosty weather. These internal pits should be level inside, and carried up to within 2 feet of the glass at the outer or opposite sides to the central path. I am presuming that the house will be built without side lights, and will consist simply of walls and a span roof. The top course of bricks in the pits should be set in good cement, or they will always be liable to become loose. Whilst the Cucumbers are in, the pits may be filled with tan, or a mixture of stable-manure and leaves, the bottom-heat from which will greatly assist the plants and save fuel. The alternate lights on each side should be made to slide, in order to afford ventilation. This will be found to be a cheap and useful house, and will answer the purposes mentioned. It will be still further improved, as regards ventilation, by having half-a-dozen openings, each 12 inches by 18, in the outside walls, on each side, a little above the level of the flue; they can be closed by flaps, made of inch board, hinged at the top, or by slides made of similar material.—T. BAINES.]

CROSSING CYCLAMENS.

MANY now cultivate the Cyclamen persicum, and, as the best way to keep up a yearly succession of plants is to raise a batch of seedlings annually, the importance of fertilising with a view to gain improved types will be at once apparent. The best time to fertilise the blossoms of the Cyclamen is during the early part of the month of March, but it may be done as late as April. The later it is done, however, the less the chance of obtaining the desired result, as all flowering plants are more or less fertilised by the agency of insects during the late spring and summer months, and the access of any of these to the flowers may upset all the calculations of the operator. Crossing should be done when the sun shines, and the first business is to select the parent flowers. The pollen parent should possess undoubted good qualities that it is desirable to transmit to the progeny—such as large blossoms, fine-shaped, or vividly-coloured

flowers. The operator should take hold of the stem between the thumb and forefinger of the left hand, just below the flower, with the thumb-nail of the right hand rap against the side of the bloom, and the pollen will be found lodged on the thumb-nail of the left hand. The seed parent should possess a good habit of growth and well-marked foliage; these qualities are indispensable, and the pollen should be applied to the blossoms, fertilising not more than six, which are ample to produce seed—probably Mr. Little would not impregnate more than two or three. The operation of applying the pollen is one requiring to be done with some care—the stigmatic organs are extremely delicate, and will not admit of any rough usage. The pollen should be gently applied to the stigma, and it will be found that at least a small portion has adhered, which is all that is required. Some growers are of opinion that it is not advisable to cross the ordinary white form of *C. persicum* with a deeper-coloured flower, except to obtain variety; the aim should be rather to keep them distinct, and improve each variety separately. If a flower combines good shape and high colour, but an indifferent habit, it may be used as the pollen parent, crossing with it another coloured flower possessing good dwarf, regular foliage; and the result will be, in most instances, an improved habit, combined with fine quality of flowers in shape and colour. Flowers emitting an agreeable perfume should be crossed one with the other, in order to increase and perpetuate this desirable property. The seed parent should not be overloaded with pods—not more than six blossoms on a large plant should be allowed to seed; if a greater number are retained there is danger of the seed being small, and the plants obtained from it, in all probability, will be found wanting in that vigour which is at all times an important item in obtaining seedlings. After fertilising the flowers intended to carry seed, all others should be removed, and the plants placed in a somewhat shady part of the greenhouse. It has sometimes been objected that certificates should not be given to fine forms of the *Cyclamen persicum*, on the ground that they cannot be propagated; the old practice of dividing the corms being well nigh abandoned by cultivators. On the other hand, cultivators like Mr. Henry Little state that any one variety, especially if artificially fertilised with its own pollen, will reproduce itself with almost unvarying exactness. The first position is unsound and impolitic, because it leads to the inference that new plants and flowers should be recognised only so far as they possess a commercial value and can be put into circulation. The second position is mainly a correct one, but it is not always reliable, unless great care can be taken to isolate the plants to be propagated by seeds, and then not to be absolutely depended on. An illustration in point was furnished in Mr. H. Little's fine collection of *Cyclamens* at the last meeting of the Royal Horticultural Society. Mr. Little fertilised with his own pollen a pure white variety of excellent qualities, and obtained from it some sixteen or so seedlings. All but one were reproductions of the seed parent, with slight variations, and this was of a pleasant pale pinkish-rose hue, in other respects an exact counterpart of the seed parents. Mr. Little supposes some fugitive pollen from another variety with coloured flowers affected the colour of this member of the progeny, but it is perhaps open to doubt whether such a surmise is correct.—“The Gardeners' Chronicle.”

Cool Orchids.—We are about to make a collection of cool Orchids, and I think of commencing with about a dozen good sorts; but before obtaining them, will you kindly tell me what kinds are the best for my purpose. They will have a temperature not lower than 50°, except perhaps during very severe weather. The house in which they will have to grow is fully exposed to the sun and shaded with tiffany.—PALMER. [You cannot do better than obtain the following cool-growing Orchids as a commencement, viz.:—*Masdevallia Veitchii* and *Lindenii*; *Odontoglossum Alexandræ*, *O. luteo-purpureum*, *O. nebulosum*, and *O. pescatorei*; *Sophranitis grandiflora*; *Oncidium macranthum* and *O. cucullatum*; *Disa grandiflora*; *Lælia anceps* and *autumnalis*. These will all do well in a moist atmosphere that is not allowed to sink below 50° in severe weather. During hot weather keep the thermometer as near 60° as possible, and give plenty of air night and day. They should never be allowed to get quite dry at the root, and plenty of water should be thrown on the floor during dry frosty weather.]

Making Cuttings without Joints.—In your issue of the 16th ult. I observe an answer to a correspondent on the above subject, in which Mr. J. Muir states that it is not necessary when preparing the cuttings to cut them closely beneath a joint. Now, having been in practice many years as a propagator, of course I can speak from experience, and I quite agree with him as regards the cuttings of such soft-wooded plants as *Verbenas*, *Fuchsias*, *Petunias*,

&c.; these do not require cutting immediately beneath a joint; but does he mean to say that a *Pelargonium*, either zonal or fancy, will root as well or as quickly without being cut closely under a joint? If so, I must differ from him. For years I have had to keep up a supply of our choicest zonals, as well as tricolors, bicolors, and other varieties, and I have tried them both ways. I have put in an equal number side by side, and have given them precisely the same treatment, except the preparation of the cuttings, and I have been compelled to come to the conclusion that the non-jointing system will not do for *Pelargoniums*. My experience teaches me that if there is any wood left below the joint they will not root until that wood has decayed up to the joint, and in nine cases out of ten where the extra wood has been left they will not root at all. With such a percentage as that it would never do to risk the propagation. I send you a cutting that has been inserted so that the soil covered two joints; you will see that it has rooted at each joint, but you cannot see a single fibre protruding between the joints.—E. G. OTTEWELL, Woolwich.

Top-dressing Azaleas and Camellias.—I do not think that Mr. Baines (see p. 257) need apprehend that anybody would think of removing the top soil from an Azalea, if its roots were packed together on the surface in the way which he mentions. I am well aware of the evil which would result from such a practice; not only in the case of the Azalea, but also in that of all other hard-wooded plants. What I advocated was surface-dressing as a means of inducing roots to keep near the surface; and I certainly had no intention of advising that a mass of surface-roots should be removed to make way for others. I therefore repeat what I have previously said, that Azaleas are benefited by a surface-dressing, or by any other treatment that will bring roots abundantly to the top. I am inclined to think that Mr. Baines did not give the Camellias on which he experimented a fair chance of illustrating the good which follows careful top-dressing, “when he surface-dressed them each season for some five or six years.” The result would certainly have been different had the top-dressing been put on the first season, and allowed to remain undisturbed for the next five or six. It is when the roots find their way into a suitable surface-dressing, and are left there to feed and work in peace and quietness, that the benefit derived from surface-dressings becomes evident.—J. MUIR.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Himalayan Rhododendrons.—Dr. Moore writes to us to say “Our Himalayan Rhododendrons are grand at present, but getting too high for the structures they thrive best in. What a pity they are not a little hardier.” True; yet how valuable they are for those who wish to plant conservatories in the picturesque style, and what treasures for warm temperate countries like California and parts of the south of France!

Standen's Manure.—If this be applied occasionally to *Dracænas* and *Crotons* it will cause them to colour beautifully. It is not necessary to have the pots full of roots before using it, as a sprinkling given shortly after potting will cause the leaves to colour from the first. When the pots are full of roots, and the soil is exhausted, it will keep the plants growing where it is impossible to shift into pots of a larger size. Sulphate of ammonia is useful for the same purposes.—R. P. B.

Colax jugosus.—In addition to the unique aspect and beauty of the flowers of this, as yet, rare Orchid, they have the further recommendation of being marvellously persistent. It is now nearly two months since we (“*Irish Farmers' Gazette*”) alluded to its being in flower in the Glasnevin collection. We have seen it again there this week, and the flowers look as fresh and lovely as they did then; even the snowy purity of the white sepals is not in the least dimmed.

Bertolonia Houtteana.—This is said to be a plant of great beauty. It was raised from seed by Mr. Van Houtte, of Ghent, but we are not informed from what source the seed was procured. During the last season it was exhibited at numerous shows in Belgium, and was universally admired, and gained several gold medals. It is reported to be of the easiest cultivation under a bell-glass. There is no description of the plant in Otto's “*Garten Zeitung*” from which to quote, beyond that it is stemless, and the sparkling colours of jewelled foliage defy imitation.—H.

Potting Bedding Geraniums.—I think there is little use in being particular about placing bedding Geraniums in the centre of the pot, when they are potted off singly. By placing the plant against the side of the pot, 100 may be potted in the time which it takes to place sixty in the centre. Placed at the side they do not, it is true, look so neat, but this is of no importance, as it matters little how bedding plants are set, provided they are effective about the middle of May, and my own opinion is that plants start away more freely with their roots at the edge of the pot, than at a distance from it.—M.

Imantophyllum miniatum.—This is a remarkably fine and free-blooming plant, that makes a good specimen, when well grown, for room or other indoor decoration. It requires little attention for several months in the depth of winter, and if it be grown freely, and is carefully tended in summer, it will stand under a stage without injury, and require but little water, the frost being excluded. If not over-potted the previous year, it will, by giving it a temperature of about 60° at night, throw up its flowers in about three weeks. A plant here in an 11-inch pot, treated in this way, has at present eight strong flower-stems, which have from twelve to seventeen blooms each. Plants in 6-inch pots, with half the amount of flower-stems, would be, I think, very useful.—A. HENDERSON, Thoresby Park.

THE GARDEN IN THE HOUSE.

DINNER-TABLE DECORATION.

Gold Services.

UPON an oval table, which was 21 feet long and 10 feet broad, and which would accommodate twenty-six persons, it was proposed to place a very large silver-gilt epergne with three branching arms, and also two handsome silver-gilt tazzas of a very ornamental character. There were also, for use if required, three beautiful gilt dessert services, each consisting of four similar dishes, the services being of the several heights of 8, 10, and 13 inches. With ornaments of this character at disposal, it becomes the duty of the table-decorator to make the floral decorations subservient to the plate, and to take care that the materials and colours used are such as will contrast with, and set off, the metal-work. With this object in view, it was evident that all yellow flowers and fruits must be avoided. This was no great hardship, so far as flowers were concerned; but it was a different matter with fruit, since it struck out Oranges, bright rosy Apples, and Pines, which make an effective display on a large table. As scentless blue flowers are scarcely to be had at this season of the year, and as so few of them at any season show well under artificial light, it left nothing to choose from amongst bright colours (exclusive of the indispensable white and green) but crimson and scarlet; and, as the latter would not afford such a striking contrast to the gold as the former, it was determined that crimson and white should be the colours used. The construction of the dinner-table permitted the insertion of ten



A Graceful Table Decoration.

plants through its leaves, at about 2 feet from the edge, and at intervals of 3 feet. It was, therefore, resolved that plants of *Dracæna congesta*, each about 15 inches high above the rim of the pot, should be put through the table; this having been done, the table-cloths were laid, and zinc trays filled with Moss were arranged in a ring around each plant. The sides of these trays were hidden by fronds of *Polystichum aculeatum*, inserted diagonally into the wet Moss, in which were placed alternately trusses of white *Azalea* and of *Monte Christo Pelargoniums*. The arrangement, when finished with some fronds of *Maiden-hair Fern*, presented the appearance shown in the accompanying engraving. Had the table not been prepared for pots to be put through it, I should have selected dwarfier plants of the *Dracæna*, and I should have bent a few fronds of common *Fern* over the edge of the pots to hide them, and have arranged around each pot a ring of plants of *Cyclamen persicum*, alternately crimson and white. It will be noticed that the foliage bore an unusually large proportion to the flowers in the arrangement here illustrated; but this was done designedly, because of the desire to show off the gold plate to the greatest advantage. At the same time, even if there had been no service of this kind on the table, I do not consider that any apology need be made for arrangements like this, since I would always much rather see an excess of foliage than the too common excess of flowers upon dinner tables. The oval space within the ring formed by these ten groups left ample room for the three larger portions of the service already referred to, the floral decoration of which I will not now describe. Of the dozen smaller dishes, ten were selected, and one was placed mid-way between every pair of *Dracænas*, two of the tallest being opposite the middle of the table, and the four

shortest being on either side of the *Dracæna* at each end of the table. It must not be supposed that the uniformity of the ten groups of *Dracænas* resulted in a monotonous or formal effect; on the contrary, the perfect similarity of the floral decorations served as a foil to the irregularity in size of the gilt dishes between them. And this diversity was carried still farther by placing in them a variety of dull-coloured fruits, such as *Russet Apples*, *Easter Beurré Pears*, *Bananas*, *Figs* (dried), *Almonds* and *Raisins*, *Filberts*, *Walnuts*, *Brazil* and *Sapucaya Nuts*, and *Olives*. Thus each gold dish was supported on either side by plenty of foliage, and the combined oval ring of decorations and fruit formed an effective setting around the three large central ornaments.

W. T. P.

BUTTON-HOLE BOUQUETS.

THE bouquets now exhibited in the florists' windows are for the most part composed of a *Rose-bud*, *Gardenia*, or flowers of that class, which, at this time of the year, are expensive; a bouquet made of them being seldom sold for less than eighteen-pence or two shillings; their high price certainly deters many, who would otherwise do so, from purchasing one every day, and this fact induces me to say a few words in favour of the employment of more simple and less costly flowers for this purpose. A few days since, I saw some bouquets, arranged with flowers of the latter class, exhibited for sale on a florist's stall, together with others of a much more expensive character, and the cheaper kinds were by far the most effective. One was composed of a small fresh-looking frond of a *Fern*, similar in appearance to the *Common Bracken*. This was placed at the back, and against it rested a spray of *Deutzia* in bud, and through this were worked a few *Hyacinth* pips of a very delicate shade of pink, the whole being finished off with another spray of *Deutzia*, which had the blooms fully expanded, and was so arranged that the little sprays of blooms drooped downwards, and formed a pretty finish. No *Fern* fronds were used in the construction of this little bouquet, save that mentioned, the foliage consisting solely of the small leaves of the *Deutzia*. Another bouquet was made of lavender-coloured *Hyacinth* pips, *Snowdrops*, a couple of *Fern* fronds, and sweet-scented *Geranium* leaves; at the back was a *Fern* frond, similar to that in the previously-described arrangement, and against this rested the *Hyacinth* pips and *Snowdrops*, the latter being mounted so that they drooped outwards, whilst twined amongst the whole was one spray of *Maiden-hair Fern*. Another charming bouquet was made of *Lily of the Valley* and its own foliage only; and one also of white *Hyacinth* pips of a large size and *Maiden-hair Fern*, the white *Hyacinth* pips looking, at a little distance, very much like *Stephanotis*. There were many other examples, but I think those I have described will show that, by the exercise of a tasteful judgment, most effective little bouquets can be made of simple flowers. I drew attention, some little time ago, to the usefulness of the different varieties of the *Hepatica* for button-holes, and they also may be classed amongst the numerous varieties of simple flowers.

A. HASSARD.

Violets in Paris.—A certain linendraper announced that from the 23rd of March to the 1st of April he would, as in former years, present a bunch of *Violets* to every customer who applied to him. The consequence was a large number of persons were to be seen on the *Boulevards* with *Violets* in their hands or button-holes, and the public imagined that a thorough *Bonapartist* manifestation was organised. The *Bonapartists* cleverly selected the 15th of August, a fête for French Catholics, as the fête of the *Napoleons*. The churches are then filled, and all France has the air of praying for the Imperial family. In the evening there are fireworks in honour of persons bearing the name of *Marie*, and the *Bonapartists*, of course, set down all this expenditure of gunpowder to the account of the *Napoleonic* dynasty. The *Violet* being also appropriated as their emblem, they have confiscated to their profit one of the most popular fêtes in France, and one of the most favourite flowers. There seems a determination, however, not to tolerate this monopoly, and for some days ladies of all parties have been wearing *Violets*. The idea deserves to be encouraged, for, in spite of historical precedents, it is too bad to see flowers, the gift of the Creator, turned into a party badge and made the vehicle of political passions.—“*Times*.”

Primroses for Table Decoration.—I was once at a loss to decide with what I should fill the glass in the middle of a centre piece. Cut flowers and fruits were denied me, as I was instructed to make use of some growing plant for the purpose—either a *Fern* or a very dwarf flowering plant. As I was walking through the reserve garden my eye caught sight of a beautiful root of common *Primrose*, in full flower, with good dark healthy foliage. I got it up, lined the inside of the glass dish (so that no sand or soil could be seen) with *Selaginella denticulata*; put in a little damp silver sand; then the plant; surrounded it with sand, and finished it off by covering all over underneath the foliage with green Moss, and this arrangement, simple as it was, chanced to be very much admired by all who saw it.—H. N. P.

THE FRUIT GARDEN.

HARDINESS OF MUSCATS IN FULL LEAF.

I THINK I may say that possibly few Vineries have cost as little for fuel up to the flowering period of the Vines as our Muscat-house here has done this spring. It was started about the middle of January, the heat being turned on regularly at six or seven o'clock a.m., and turned off again at two p.m. for the first month. Afterwards, it was not turned off till six o'clock, and for the last fortnight it has been left on till ten p.m.; and this rule has been adhered to strictly, except in a few instances when the heat was turned on for an hour, when the fires were made up, as a precaution only, against frost. I cannot say exactly how much fuel has been burnt on account of the Vines, as the same fire heats other houses; but I feel sure that I speak within safe limits when I state that not a shovelful of coals has been expended on them for more than twelve hours out of the twenty-four, on the average, since the house was started till now. Some idea of the saving in fuel effected in that time may, therefore, be formed. The Vines are just on the point of coming into flower, and, within the last fortnight, the temperature in the morning has been as low as 48° on ordinary occasions, and once at 45°. Previous to this, it had often been as low as 45° and 42°, while during the day it has been the same as usual for Muscats. The weather has been very dull this spring, or they would doubtless have been in flower before this time. As it is, I do not think that they are really more backward than they would have been had the night temperature been kept 20° higher all along. The Vines are in the most luxuriant health; the bunches long, sturdy, and well spun out, and the wood short-jointed and hard. Not a trace of insects can be seen, though the Vines have neither been scraped nor cleaned in any way for years. Possibly few, if any, have subjected Muscats to such temperatures voluntarily; for I never knew anyone who would not have felt real alarm if their Muscat-house fell even to 65° on a cold night, when the Vines are in flower, or thereabouts, while 75° was considered the orthodox minimum. Of course, I do not maintain that it is at all needful to subject Vines in full leaf to a night temperature of 45°. Fifty degrees is a safe minimum, for, with a heap of leaves inside the house, scarcely any fire heat is needed to sustain that degree; but the fact that the Vine will stand such, or perhaps even lower temperatures, with impunity, is sufficient to show how utterly groundless have been our fears in former times concerning the effects of a low night temperature, and how erroneous the belief that a high temperature was necessary to the perfect fertilisation of the flowers.

J. S. W.

Peach and Nectarine Enemies.—Can you name the enclosed insect, which I send in two stages of development? It has ruined the Peach blossom, as you will see by the shoots which I send. The trees on a south wall are completely spoiled, while those facing the east have escaped pretty well. The insects are extremely few, which makes the amount of damage done by them surprising. They appear to me to be a species of minute beetle, and jump like a flea. This kind of insect has never made its appearance here before, and, I trust, may never do so again, as a greater pest could not possibly be imagined as far as Peaches and Nectarines are concerned.—H. [The insects sent are two beetles—one a *Haltica* or Turnip flea (*Thyamis ochroleuca*), and the other *Latridius minutus*—but I greatly doubt if either of these is the real culprit. The mischief done to the Peach blossoms is very distinct. In some of those sent there is a good-sized hole eaten through the calyx into or out of the interior of the opening bud, and on tearing open the fresher of these there are indications of some gnawing creature having been at work inside. Neither the ovary nor stamens are touched, the base of the pistil only being a little excoriated, but the chief mischief has been done on the green fleshy part of the inside of the calyx just below the point from which the stamens start. This has been all gnawed and excoriated, and remains moist like a fresh wound, and this fleshy part is larger, and thicker, and more swollen, than is natural, so much so, that at first sight one might mistake a glimpse of one of them for the ovary beginning to swell. No doubt the irritation produced by the insect gnawing this part has set up a morbid action, which has swelled the part in the same way that a gall is produced. The fresh excrement of the insect was there, but no caterpillar. It seems, however, most consistent with what we know of other bud feeders, that an egg has been laid in the bud, which has produced a caterpillar which has done the mischief, and when ready to pass into the chrysalis state has crawled its way out of the, as yet, not quite opened bud and fallen to the ground, there to undergo its metamorphosis. It is much to be wished that our observant correspondent should gather, if still in time, a few of the buds that are not yet pierced and put them in a tumbler with a little earth, not too

dry, at the bottom, covering the mouth of the tumbler with something to prevent the escape of the perfect insect when it comes out; then we should know with more certainty what is to blame for the mischief.—ANDREW MURRAY.]

Apricots in Bloom.—In spite of the continued cold winds the Apricots here are in magnificent bloom; a large tree of the Moor Park was in full flower as early as the 21st of March, the blooming being accelerated by the fact that the tree is growing on the south side of the cottage, and enjoys the permanent shelter of a 20-inch projecting eave. On the eastern side is a large plant of the Early Shipley, and this, on Good Friday, had not a single flower-bud expanded in that aspect, but a considerable extent of the growth that had turned the corner on to the south side was in full bloom. So much for the difference in aspect in promoting earliness, even on the same tree. It would be well if trees of this delicious fruit grew on every poor man's cottage where the situation was suitable; there are few wall fruits more easily cultivated or, as a rule, freer or more general bearers, and excellent aspects now occupied by miserable Vines or useless and unprofitable creepers, might be made to produce beautiful fruit in great abundance. It would be of the greatest benefit if some one could discover a remedy for the frequent decay of large branches; it is very annoying to have the form of a fine tree almost destroyed from this cause and not have the power to prevent it. In some gardens it is necessary to replant the Apricot wall every few years; and such grand old trees as the one at Malshanger Park, Basingstoke, are, indeed, rarities.—A. D.

Insects in Vineries.—Will you inform me what the insects sent are; and what I must do to get rid of them from my Vineries, where I have just discovered them in large numbers.—ROBERT HARVEY, *Derwent House, Little Eaton, near Derby.* [The name of the minute insects sent is *Achorutes purpurascens*. They belong to the Spring-tails, or *Thysanura* (*Poduridæ*), a class of creatures that their monographer, Sir John Lubbock, places, we think with justice, between the Crustacea and the Insects. Other authors regard them as true insects, and rank them among the Neuroptera, near the May-flies, &c. Curtis drew attention to some of these *Poduridæ* being injurious to the Potato. We have seen the small white species (*Lipura fimetaria*) busy browsing upon Carrots, although it is right to add that the Carrots were in an unhealthy state from the attacks of the larvæ of the fly *Psila rosæ*, but, at the same time, it is also right to note that they were not feeding on any injured or decaying part of the Carrots, but at the healthiest part, or thick end of the root. There they browsed away, and their work looked as if the surface of the Carrot had been shaved or rasped away, leaving a fine, clean, fresh surface. They are very minute, and he must be a good observer who, without entomological training, notices them at all. Those sent are, with a few older exceptions, only about half grown (a twenty-fourth part of an inch in length), when they get full grown they will be a twelfth part of an inch in length and much darker in colour. As the mischief done by these creatures has been very little studied, our correspondent will render good service to horticulture if he will note all particulars regarding them and their proceedings for the general good.—ANDREW MURRAY.]

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Black Alicante Grape.—I would advise all amateurs to grow this fine Grape, which ought to have been called the Gardener's Grape; here just now it is still hanging, black as Sloes, and fresh and plump. It is certainly the prince of late Grapes. Lady Downes keeps longer, but not so attractive, and is apt to scald; but Alicante knows no disease, and is always in excellent condition.—R. GILBERT, *Burghley.*

Top-dressing for a Vine Border.—Will one load of turfy loam from a pasture, one load of rotten manure, two cwt. half-inch bones, and one sack of small charcoal make a good compost with which to dress an inside Vine border?—AN AMATEUR. [The compost just named will answer perfectly. If the Vines are old, and the roots far from the surface of the border, remove the old inert soil down to the roots and lay the compost directly over them; if they are young vigorous Vines, and the roots are nearer the surface, top-dress in the ordinary way.—DAVID THOMSON, *Drumlanrig.*]

American Crab Apple (*Pyrus coronaria*).—A more beautiful object than this, when in full bloom, early in spring, it would be difficult to find. Why is it we do not oftener find it in cultivation? Its ordinary height says the "Gardeners' Monthly," is from 10 to 18 feet, with a bole of from 5 to 6 inches in diameter, but trees of it are sometimes found in old cultivated spots, which measure from 25 to 30 feet in height, with a bole of from 12 to 15 inches in diameter. Its clusters of rose-coloured blossoms, of large size, its beautiful foliage and its fragrance, make it an object worthy of attention.

Three Good Late Pears.—Allow me to recommend the three following Pears as excellent late varieties, which may always be depended upon in this locality, and come into use in the order mentioned, and give a succession of ripe fruit from January to May, viz.:—*Beurré Sterckmans*, *March Bergamot*, and *Madame Millet*. The former is very prolific and of exquisite flavour. *March Bergamot*, although not so delicate in texture as the other two, is, notwithstanding, very excellent when other Pears are scarce; it also possesses a rich *Bergamot* flavour, which is particularly refreshing at this season of the year. *Madame Millet* is the latest Pear with which I am acquainted; it comes into use in April, and continues plump, juicy, and rich through May.—T. O., *The Gardens, Wilton House.*

THE FLOWER GARDEN.

HARDY HYBRID BEGONIAS.

It may interest some of your readers to know that now is the best time to provide themselves with tubers of these beautiful and easily cultivated plants, which only require to be allowed to start into growth in small pots in a cool house (as they dislike and resent any kind of forcing), and, about the middle of May, to be turned out of the pots into a well-prepared bed in the garden, filled with rich light friable soil, in which they will grow rapidly, and soon make fine bushy plants, and begin to produce their bright showy blooms about the middle of June, from which time till they go to rest, about the middle of November, they continue to bloom almost without intermission. The flowers are almost invariably produced on long foot-stalks from the axils of the leaves in bunches of three, consisting of the large and handsome male flower in the centre, and a smaller, but equally bright, and longer-lasting female flower, on each side. About the commencement of September, when the nights begin to get chilly, the plants should be lifted with good balls, and put into good-sized pots, when, for the next couple of months, or more, they will form most acceptable ornaments for the conservatory or the drawing-room table. The hybrids to which the above remarks especially refer are those raised by Mr. V. Lemoine, of Nancy; and, as the parents from which all his seedlings originally sprang were the hardy variety, *B. Veitchii*, and the beautiful-foliaged *B. Pearcei*, nearly all his hybrids partake of the hardy nature of the one parent and the ornamental foliage of the other, while the blossoms are nearly all modifications of, and most of them improvements on, those of the first-named parent. I should specially recommend the following varieties, which I know to be really distinct and beautiful, and with which I may safely say none of your readers who invest in them can fail to be pleased:—1. *C. Camoens*; 2. *C. Glijm*; 3. *corail-rose*; 4. *mas-todonte*; 5. *rubens*; 6. *velours*. The tubers travel quite safely by post in a tin box, and are offered at a very moderate price. Mr. Lemoine also offers two new varieties for the first time this season, named respectively *Molière* and *Cornéille*, the latter often producing semi-double flowers. His fine double scarlet-flowered variety named *Monstruosa*, of which a woodcut and description were given in the fourth part of the last year's volume of the "*Revue Horticole*," has not yet been sufficiently multiplied to be distributed; he hopes, however, to have sufficient stock to be able to do so before the summer of next year.

Belgrove, Queenstown, Co. Cork. W. E. GUMBLETON.

***Campanula tridentata* var. *Saxifraga*.**—This belongs to a group of dwarf species of the section characterised by having five recurved bract-like appendages on the calyx. It grows about 6 inches high, each stem bearing a solitary flower about an inch in diameter, and as much in depth, of a pretty purple-blue colour. The radical tufted leaves are linear-spathulate, and about 2 inches in length. It is a very desirable hardy species for the rockery or border. It succeeds best in a light turfy loam with a mixture of leaf mould, and is easily propagated from seed or by division. Although there are several species of this group, all of them dwarf attractive plants, none of them have yet got into general cultivation. The one in question is figured in Regel's "*Gartenflora*" for February

of this year, which is the only coloured portrait of any of the group that we have seen. De Candolle, in his "*Monograph of the Campanulaceæ*," gives plain figures of three or four of them. They are natives of Asia Minor, the Caucasus Mountains, &c. On account of *C. tridentata* having formerly been regarded as a distinct species, and different botanists having adopted diverse names to designate the species, some confusion in nomenclature may probably ensue. De Candolle, in the work cited, employs the name *Biebersteiniana* for the species. *C. Adami* is scarcely distinguishable from our plant. Dr. Regel speaks very highly of *C. tridentata* as a hardy free-growing ornamental species, which bears the winters of St. Petersburg without injury.—H.

THE GREYISH BAMBOO.

(*BAMBUSA VIRIDI GLAUDESCENS*.)

THIS Bamboo, of which the accompanying is an illustration, has been proved to be a very hardy and free-growing plant in the gardens about Paris, and it will probably make a more vigorous growth and prove a more beautiful object in warm situations in this country than any other kind of Bamboo. As isolated specimens in sheltered glades in the pleasure ground, or in snug open spots near woodland walks, its appearance would be highly ornamental. Its stems grow to a height of 12 or 13 feet, and are about 5 or 6 inches in circumference. This variety was introduced in about 1846 by the French Admiral Cécile, and is believed, from the resemblance it bears to other plants from Northern China, to have come originally from that part of the world. Independently of its graceful foliage and elegant shape, which render it valuable for purposes of ornamentation, there can be little doubt that it may be turned to practical use in other ways. Its propagation, as is the case with all kinds of Bamboos, is rather difficult, and takes a long time. It can hardly be effected except by means of suckers, which, when the plants are vigorous, are developed in large numbers. As these suckers have a very marked tendency to push growth obliquely, this disposition should be taken advantage of; in fact, they should be bent down layer fashion, in order that a larger number of roots may be

developed; but, as the latter are formed slowly and with difficulty, separation from the parent stool must be effected with care, and the young Bamboos must not be taken up until they have rooted well. The soil that suits the Bamboo best is a rich, consistent, light, and silicious one, with plenty of vegetable matter in it.

SPRING FLOWERS.

WE can never have too many of these "gems of earth," that "come before the swallow dares, and take the winds of March with beauty." They ought to have a place in every garden, however small; they should fringe the lawn, and ornament the shrubbery borders; and, if they peep up here and there on the fresh grassy turf itself, in sheltered nooks and sunny corners, or on outlying portions of the pleasure grounds, so much the better. By the irregular margins of woodland walks or drives, and in other wild situations, they are peculiarly attractive, and a single afternoon in autumn spent in dropping a few seeds, or planting a few common hardy bulbs in such positions as those just indicated, will be the means of producing charming glimpses of bright colour where otherwise there would be none.



The Greyish Bamboo.

Primroses, Blue Bells, Forget-me-nots, and Wood Anemones may, perhaps, be naturally plentiful in such places; but this should by no means prevent us from gilding the margins of our shrubberies with Crocuses and golden Daffodils. Unfortunately, experience shows that it is difficult to naturalise Crocuses; their fleshy corms are the favourite food for mice, which greedily devour them at every opportunity. In the meadows near Nottingham, however, the common purple *Crocus vernus* defies those little pests, which is accounted for by the meadows being inundated with water for months together during winter and spring. The Daffodil defies all its enemies, for both its roots, leaves, and flowers are fatally poisonous to them, and neither mice nor cattle will touch them. It is one of the best and brightest of all spring flowers for naturalisation, and it is sufficiently robust to establish itself in all kinds of soils and situations when once introduced. Of Crocuses, which are amongst the loveliest of the young year's gifts, many of the most striking kinds are unknown in our gardens. The best collections with which we are acquainted are those of Major Trevor Clarke, the Rev. Mr. Harpur Crewe, and Mr. Ellacombe; whilst Mr. Barr possesses a great number of species and varieties from different climates in his grounds at Tooting. Among those now in flower there are several forms of *C. mosiacus*, including *luteus*, *aureus*, *sulphureus*, and *sulphureus striatus*, all yellow, the last having its outer divisions streaked with brownish-purple, and *lacteus*, a pretty and distinct form, of a milk white colour. The rich orange-yellow brown-streaked *C. susianus* or *C. reticulatus*, as it is frequently called, is also now in beautiful condition. This last is a distinct plant from the Crimea, and is very hardy. The Scotch *Crocus biflorus*, with its thin grassy leaves and pearly purple-streaked buds, is well worth culture, as it is very hardy and a most profuse bloomer. *C. Sieberi* is a pretty little species, which varies from a clear lilac-purple to a nearly pure white, some of the forms being delicately striped or feathered. This plant is figured in the "Botanical Magazine," t. 6,036, where it is described as a native of Greece, and where it is stated that the *Crocus veluchensis* of Herbert, a native of Morea and Transylvania, differs from it chiefly in the orange colour of the throat being wanting. The pretty little species which Mr. Barr grows under the name of *C. veluchensis* is nearly white. *C. sulphureus* is a clear sulphur-yellow, and quite distinct from other yellow-flowered kinds. *C. Wildeni* is white, with a purple base; and *C. Wildeni* var. *dalmatica* has the inner petals white and the outer ones purple. The following Squills are likewise just now in perfection, viz., *Scilla bifolia*, with brown foliage and intense purplish-blue flowers; *S. amoena*, differing from *S. bifolia* in the foliage, being greener, and the flowers of a deeper blue; *S. bifolia alba*, with white flowers; *S. bifolia rosea*; *S. bifolia major*, or *grandiflora*, foliage green, and flowers large and rich blue; *S. præcox* in the way of *S. bifolia*, flowers light blue; *S. sibirica*, ranging from intense deep blue to light sky-blue; *Narcissus Pseudo-Narcissus* var. *nobilis*, crown yellow, perianth sulphur, is now blooming freely; *N. pseudo-Narcissus Telemonius* is a bold flower, with a deeper crown than the last. This is the single form of the large double-yellow Daffodil, so well known in gardens and fields, and stated by some to become single when growing wild, and to retain permanently its double form only in cultivation. Mr. Barr has repeatedly selected from beds of this large double Daffodil (*N. Pseudo-Narcissus Telemonius plenus*) flowers all but single, the only evidence of duplication being a solitary petaloid segment in the centre, but these have always reverted to the perfect double form. Mr. Barr informs us that he has had three large beds of it, collected from the fields in Kent, Herts, and Lincolnshire, under cultivation in his grounds, at Tooting, for several years, and not a solitary bulb among some thousands shows the slightest symptoms of becoming double. The Lincolnshire form of the *Pseudo-Narcissus* appears to be a stronger grower than those found in Kent and Herts. The rich purple and gold-tinted *Iris reticulatus* is just now one of the most showy of all spring flowers, and its blooms last a long time after being cut, and they are most delicately perfumed. This plant ought to find a place in every warm sunny herbaceous border; but it flowers at least a fortnight earlier, and its blooms are fresher if it has the shelter of a cold frame. Among the most beautiful of all spring-blooming plants are Primroses, the double white, lilac and sulphur being now very effective. Of all the double Primulas that known as Golden Plover deserves a place on every sunny border; its flowers are of a rich yellow, and in quantity look like golden rosettes. The Dog's-tooth Violets are also now very effective, one, a large white-flowered variety, having apple-green foliage richly blotched with dark purplish-brown. This is the *Erythronium album grandiflorum* of some gardens, and is a perfect gem in its way, well worth a place amongst fine-foliaged plants apart from its snow-white flowers. The old but still rare *Puschkinia scilloides* is just now in bloom and is very neat in habit, with erect spikes of white star-like flowers, each segment having a stripe of sky-blue

down its centre. These are but a tithe of the lovely spring plants now in bloom in good collections, for, as will be seen, we have said nothing of the dwarf Phloxes, Hepaticas, hardy Cyclamens, Violets, Aconites, and a hundred other old-fashioned flowers which require but little attention after they are once planted. B.

ERYTHRÆA MUHLENBERGII.

THIS new hardy annual belongs to a group of plants, remotely allied to the Gentians, the majority of kinds in the group producing rose-coloured flowers. *E. Muhlenbergii* grows from 12 to 18 inches in height, and has opposite, oblong-spathulate-shaped leaves, erect flower-stems, with terminal cymose clusters of bright rose-coloured flowers, with yellow centre from 1 to 1½ inches in diameter, and produces a succession of bloom, which, Messrs. E. G. Henderson state,



Erythraea Muhlenbergii.

retains its beauty in a cut state for several weeks. Its profuse flowering, neat growth, and richly-coloured blossoms, distinguish it as the most effective species in the class to which it belongs.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Sedum amplexicaule.—I think this will prove a charming variety for carpet bedding. It differs considerably from *S. Lydium*, *S. glaucum*, and *S. acre*, as the growth is not so obtuse, but rather resembles that of a minute *Portulaca*, creeping closely, and with compactness, over the surface of the soil. The base of the growth is comparatively hard-wooded, but it can be propagated freely from the young shoots. The foliage is in colour a pale glaucous green, and would offer a beautiful contrast in panel bedding to the rich lines of the *Alternantheras*.—D.

The Blue Winter Aster.—In Mr. Hayes' extensive glass garden at Lower Edmonton, the plant known in collections of hardy plants as *Stokesia Cyanea* is extensively grown for its winter-flowering qualities. Usually it flowers so late in the open air that we never enjoy the flowers. Mr. Hayes' plants, being indoors at the flowering season, receive no check, and go on flowering from October to March and April, the blossoms now on the plants being small and weak compared with those they yield in autumn. It is a valuable winter flower, and quite distinct from any other to be had at that season.—R.

Wintering the Pampas Grass.—The effects of the severe winter are now beginning to be seen about here as spring advances. Several of my neighbours who like to see all their plants in a neat state during the winter had the decayed foliage clipped from their Pampas Grass early in autumn, leaving the stems and crown quite bare. It now happens that very few, if any, of those so treated are able to grow, having evidently been killed by the cold and exposure. The decayed wood or leaves of many plants would, if left untouched until the plant is about starting into growth in spring, save the life of many a valuable plant.—A. B. G., *Nofts*.

Anemone palmata.—I have now in flower in pots this pretty bright yellow Anemone raised from dried roots, but, without doubt, it would be even earlier from roots that had not been lifted. The leaves are tri-lobed, and grow on very short stalks, at present not more than 1 inch in length. Flower-stems 4 inches in height, supporting two successional blooms which spring out of a leafy sheathing. The flowers are about 1½ inches in diameter, and in appearance are like a loose *Cineraria*, having an outer layer of petals, and an inner row placed immediately between the interstices of the others. The flowers expand early in the day, but close up a few hours after noon.—A. D.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Kitchen Garden—Sowing Broccoli, Lettuce, &c.—A sowing should now be made of Broccoli for autumn and winter use; it is better to sow a little now, and again later on. It frequently happens that, in a very mild winter, the plants intended for late use come in earlier than they are wanted, leaving a blank which the second sowing will fill up. The following kinds, which were enumerated in the list of vegetables given some time back, will afford a succession:—Backhouse's White, Snow's Winter White, and Williams's Alexandra; these, with Walcheren and Veitch's Autumn Giant Cauliflower, which two latter, with good management, will keep up till Christmas, and will be found to last until late in the spring. Dress the seed, as previously advised, with red lead to preserve them from birds, as a failure in this sowing of these important vegetables would cause a blank in the crop. A little more Lettuce should now be sown (Cos and Neapolitan Cabbage), as also small salads and Radishes; by sowing these things a little at a time and often, a continuous supply may be relied upon, notwithstanding extreme dry or wet seasons, in a way that cannot be done where the sowings are made at longer intervals. Ground that has been occupied by winter Cabbages, Coleworts, &c., should, as it becomes vacant, be dug; if it requires trenching, bury the stalks and refuse leaves of the preceding crop in the bottom of the trench as the work proceeds. This is even better than removing it to the refuse heap, as it slowly decomposes in the ground, affording acceptable food for the roots of future crops. The dry cold weather we have had for some weeks has had the effect of bringing the soil into condition for cropping; where the land is heavy and retentive that which was dug during the winter will be much benefited by being again turned over with the digging fork previous to cropping; the sun and air acting upon it, after being thus loosened up, will pulverise and render it much more suited to the requirements of the tender roots of germinating seeds. When the land is thus brought into a fine tilth, even the most hardy vegetable will progress in a way not possible when the soil is in a hard lumpy condition. Keep the hoe going in dry weather amongst existing crops of Cabbages, Winter Spinach, early Peas, and Beans; the object ought to be not to allow a weed to get an inch high, and they are destroyed with one-tenth the labour whilst thus small. Red Cabbage and autumn-sown Savoy should now be planted, and, as these are no better for being grown extra large, 18 inches apart in the rows, and 2 feet asunder between the rows, will be sufficient space for them.

Asparagus.—Where new plantations have to be made it is now the proper time to do so. Many amateurs are deterred from attempting the cultivation of this vegetable under the impression that the preparation of the ground is too costly an affair. If new soil and manure are introduced, wherewith to make the beds of a depth of 4 feet or so, as some advise, it becomes expensive; but such is not necessary to secure Asparagus good enough for ordinary use. If the ground is well trenched, and liberally manured, the dung being got down as low as the soil is stirred, and a depth of 2½ feet can be secured without reaching the raw cold sub-soil, it will answer; where a greater depth can be had, all the better, but it is not altogether necessary. Where the land is sufficiently drained, I prefer planting on the level to the ordinary system of beds with deep alleys; the old method of growing this vegetable so close (four rows on a 4 feet 6 inch bed) is a mistake; let the rows be 2½ to 3 feet apart; the produce will be much finer, and the plants last longer at this distance. In planting, cover the crowns with about a couple of inches of fine soil; the roots should never be allowed to become dry, as this is likely to injure them, or prevent them growing altogether. I prefer one-year-old plants to the two-year-old ones often used; those who are disposed to raise their own plants and wait a season can sow the seeds at once, in the beds, in shallow drills, the same distance apart as recommended for planting, thinning the plants out as required. If the weather is dry after planting give water; keep the ground free from weeds, but do not crop between the rows with anything else, as it only impoverishes the ground, and is more loss than gain.

Slugs.—It is often said that slugs and bad gardening are generally found together; and such is the case, yet I have seen gardens where the cultivation was so good that by constant stirring the surface-soil a weed was scarcely ever to be met with, and still these pests existed in thousands so as to make it almost impossible in the spring to get anything they feed upon to grow. Peas, Lettuce, Cauliflowers, Cabbage, or anything they will eat, are destroyed in the most provoking manner. Dusting the crops with soot and lime is more or less effective whilst the weather is dry, but when showery, it is washed off as fast as applied, and the dustings may be repeated until the remedy has as injurious an effect as

the evil it is intended to check. Where such is the case the whole surface of the ground should receive a dressing of lime. There is no better time for applying this than at the early dawn—on one of those mild damp mornings we often get in April—at which time they may often be seen so thickly on the ground as scarcely to admit of a foot being put down without treading upon them. Four or five cwt. of lime will be sufficient for an acre of ground. It should be prepared by spreading it thinly out on a damp floor until it has absorbed as much moisture as to reduce it to a powder. The way to apply it is to procure a box as large as can be carried under the arm, and then sow it by hand in the same manner as sowing Corn broadcast. In this way a man will, in a short time, go over an acre of ground. To be effectual the whole garden should be thus sown over. It must be observed that it is only on those damp mild mornings that the slugs will be out in number. If the air is at all dry or frosty, instinct teaches them to keep under cover, but if a favourable day be selected, and the job carefully done, more of these pests will be killed by one dressing in this way than would be destroyed by a whole season's work with partial measures, nor is the lime wasted, as it acts beneficially on the land.

Strawberries.—These will now require attention. First go over them with the hoe, stirring the soil betwixt the rows. If there are any small weeds it will destroy them, and if any of larger growth, they must be removed. After this the Strawberries should at once receive their spring dressing of stable manure. That which has lain together a few weeks will be in the best order. This should be put on a couple of inches thick, the whole of the ground between the plants being covered. The manurial portion will get washed in with the rains, the straw will be left quite clean, and in a condition for keeping the fruit from getting soiled with heavy rains. If applied at once, there is plenty of time for the straw to get thoroughly cleansed and sweetened by exposure to the weather; in this respect it will be just as good as the new straw that is sometimes placed on just before the fruit is ripe, and it has the advantage of acting as a manure just at the time when it will benefit the crop, and serve as a mulching which prevents the undue evaporation from the soil of the moisture stored up during the winter, and of which these shallow surface-rooting plants stand so much in need whilst the crop is swelling. Nothing can be more unsuitable than the mulchings of Grass mowings sometimes used. These are naturally cold; in addition to which, whatever seeds are in them will germinate, filling the ground with Grass, which is much more difficult to deal with in a kitchen garden than annual weeds.

Shrubberies.—In many gardens the shrubs are often met with in a most unsatisfactory state, in some instances never having been thinned out from the day they were first planted; and, where sufficient time has elapsed, it is no uncommon occurrence to find them all grown together in a thicket, instead of standing clear of each other, so as to allow every plant space to assume its natural habit of growth, and where they have not been allowed to encroach one on another; the equally objectionable practice of keeping them cut in until the whole has much the appearance of a meadow covered with large haycocks. Now, if, instead of this there had been timely thinning carried out, whilst the plants were not yet too large to move, the result would have been infinitely more satisfactory. If there is no use for the superfluous plants elsewhere, it is much better to destroy the least valuable. Where good shrubs, like the Holly, the Rhododendron, or the Aucuba, are standing with a coarse-growing common Laurel the latter will encroach upon and shortly smother the whole. Hesitate not, therefore, to cut it out at once. It is better to have three good plants than four starvelings. The present is the best time to prune whatever is required amongst evergreens, but wherever the knife is required it should be used very sparingly, and only to reduce any straggling branches. Do not attempt any pruning that will destroy the natural habit of the plants, or at all tend to give them a formal appearance, for this is worse than allowing them to grow in what may be termed a wild state. Many varieties of shrubs, that have been allowed to get into an unsightly condition by overcrowding, may with advantage be headed down to within 2 feet or so of the ground; common and Portugal Laurels especially will be much improved by this, and will soon form good heads.

Annuals.—These should now be sown in the open borders; they are not nearly so much grown as they used to be since bedding plants came so much into fashion, yet there are numbers of very beautiful things amongst them, some even that cannot be dispensed with. Sow Mignonette in sufficient quantity, as it is invaluable for cutting. Nemophila insignis, Convolvulus minor, Calliopsis, white and purple Candytuft, Clarkias, Collinsias, Godetias, Love-lies-bleeding, Eschscholtzias, Ice Plant, Sweet Peas, Nasturtium, Virginian Stock, Schizanthus, Gilias, Helichrysums, and Lupins. These are a few hardy annuals that are worth a place; do not sow the seeds too thickly, and cover about half an inch with sifted soil and wood-

ashes mixed, if the latter are at hand, or a little charred earth, as these keep off slugs.

Gladiolus.—A portion of the stock should now be planted, especially where these beautiful flowers are in demand for cutting; these early-planted bulbs will furnish flowers that will be succeeded by others planted later on. If possible, give them a place where there is a fair depth of good soil, neither of a clayey nature nor yet light and sandy—either extremes of which they do not like. I have generally found disease to attack them most where the land was very light; they like the soil moderately rich, and it should invariably be well pulverised.

Pits and Frames.—Now sow for planting out later on the following half-hardy annuals:—*Rhodanthe Manglesii*, *Phlox Drummondii*, French and African Marigolds; *Tropæolums*—*T. canariense*; *Zinnias*, and *Ipomæas*; and the following tender annuals for indoor culture:—*Celosias*, *Thunbergias*, *Globe Amaranthus*, *Balsams*, and *Cockscombs*. These should be sown in shallow pans, well drained, in a mixture of fine sifted loam three parts, leaf mould two parts, and a little sand, just covering the seed, after which, press the surface with the bottom of a flower-pot, so as to make it a little firm, in which state the soil will not dry so soon, and consequently not require so much water before the seed germinates, which, with some seeds, is liable to cause decay.

Houses.—Peaches that have set their fruit should now be well syringed every afternoon, to keep the foliage free from insects, and assist the fruit to swell. See that the soil is sufficiently wet, not only near the surface, but down as far as the roots go; many a crop is injured or lost from want of attention to this matter. Attend to the tying of *Pelargoniums*, *Calceolarias*, and similar plants; and keep a good look out for aphides. When these are found, at once fumigate, not allowing them to increase in quantity before they are molested, in which case the difficulty of destroying them is much greater, besides the injury they do the plants. Lilies now growing will require more water, and should be kept near the light in a cool house.

Cinchona or Chinchona.—Mr. Markham, in a lately-published "Memoir of the Lady Ana de Osoria, Countess of Chinchon and Vice-Queen of Peru," wishes to prove that the name cinchona, applied to Peruvian bark, should be altered to chinchona. The knowledge of the efficacy of Peruvian Bark was undoubtedly brought to Europe in the year 1640 by the Countess of Chinchon, on her return to Spain with her husband at the expiration of his term of office as Viceroy of Peru. This lady, during her residence there, was attacked by tertian fever, and cured by the use of Peruvian bark. On the return of the Count and Countess to the Castle of Chinchon, the Countess, who had brought with her a supply of the precious bark which had effected such a wonderful cure upon herself, "administered Peruvian bark to the sufferers from tertian agues on her lord's estate in the fertile but unhealthy vegas of the Tagus, the Jarama, and the Tajuna. She thus spread blessings around her, and her good deeds are even now remembered by the people of Chinchon and Colmenar in local traditions" (p. 45 of the Memoir). Though from time to time during the succeeding hundred years powders of the Peruvian bark were imported into Europe, no scientific account of the tree was published until 1740, in which year De la Condamine published a description and figure in the Memoirs of the Academy of Paris for 1738, under the generic name of *Quinquina*. This communication contained also an account of the history of the drug, wherein the name of the Countess of Chinchon was duly mentioned and properly spelt, and on the information obtained from it, and quoted in acknowledgment, Linnæus, in the second edition of his "Genera Plantarum," published at Leyden in the year 1742, founded his genus *Cinchona* in honour of the Countess of Chinchon. The word cinchona, however, has now become settled by the usage of upwards of a hundred and thirty years, and sufficiently recalls the name of the enlightened and benevolent lady to whom Europe owes the introduction of this most useful therapeutic agent.—"London Medical Record."

Epping Forest Enclosures.—In the new Act to extend the time for the Epping Forest Commissioners to make their final report, there is the following provision against any new enclosure:—"Any person who shall, in contravention of any order made by the commissioners under the 5th section of the Epping Forest Amendment Act, 1872, make any enclosure of any land within the said forest not enclosed before the passing of the Epping Forest Act, 1871, or wilfully or maliciously commit any waste, injury, or destruction of vert herbage, trees, shrubs, or other growing things in or upon any land within the said forest to which the order relates, shall be liable to a penalty not exceeding £20, to be recovered upon summary conviction."

HOUSETOP GARDENING.

Or the tens of thousands who daily travel by the numerous high-level lines of railway which penetrate the metropolis, few can fail to be impressed (or rather depressed) by the utter dreariness and ugliness presented, mile after mile, by the housetops among which the train proceeds. The great fire of 1666 caused sad havoc with the high-pitched roofs of old London; and hence the quaintly carved gables and pinnacled domes which distinguish the roofs of so many Continental cities, and not a few of our own mediæval towns, are rare indeed in London. The rebuilding and extensions which followed in later Jacobean and Georgian times unhappily took place simultaneously with the decadence of the picturesque in domestic architecture; and, if truth must be told, in our own Victorian days, the "skyline" of our streets is determined rather by the most economical compliance with the Building Act, than by principles of Art, though in the case of hotels and similar great undertakings there have lately been marked improvements in this respect. There is, however, another aspect, besides the æsthetic, from which to view such questions. More than once, attention has been directed to the waste of space, represented by this vast area of unutilised London roofs. Here and there, at wide intervals as we speed along a viaduct, may be seen a photographer's rickety studio perched against a chimney stack, and perchance a few smoke-stained flower-pots and half-withered shrubs on a sooty flat. All else is abandoned as a watershed for the elements, and a trysting-place for cats. We have been led to make these remarks by a step in the right direction, taken by Messrs. Barr & Sugden, whose new building, erected in King Street, Covent Garden, we this week illustrate with a view, showing how town roofs may not only be utilised, but may be rendered ornamental. For the requirements of their trade in plants, it was necessary to have upon the premises glass erections of considerable size; and, as will be seen by a reference to our engraving, the roof area has been wholly devoted to this purpose. To conform to the requirements of the Duke of Bedford's lease, the roof proper of the premises terminates with a strongly-constructed lead flat, above the third storey of arch-headed windows; and, above this, the conservatory is constructed, a strong trellised floor being laid over the flat roof, and the walls taken up to support the roof of the conservatory. The structure comprises a central Palm or tropical house, 36 feet long, and 18 feet wide, with a lofty arched roof, and two side wings, each 10 feet wide—one for the reception of Ferns, and similar plants, and the other a cool house for bulbs. The hot-water pipes in the Fern department have been furnished with Taylor's patent ventilating zinc boxes, by means of which a continuous supply of fresh air is introduced from the outside, warmed, and then allowed to escape into the house at the required temperature, which, by means of this appliance, is comparatively cool and enjoyable although the thermometer registers 69°. A temperature in the tropical department only 2° higher than this seemed much more oppressive. Considering the exigencies of a London atmosphere, and the requirements of the Building Act, it was determined by the architects, Messrs. Spalding & Knight, of Queen Victoria Street, to apply Howitt's patent to the construction of the roof, which is a combination of wood and iron and which has been skilfully carried out by Messrs. Fletcher & Lowndes, of Great George Street. Both house and conservatory are heated by means of hot-water pipes, attached to a 4 feet 6 inch saddle boiler, set in the basement, some 60 feet below the conservatory, each floor having independent flow and return pipes, which are of two different diameters, *i. e.*, the pipes which convey the water to each floor, and also the returns, are both 1 inch in diameter, whilst on the floors themselves 2-inch pipes are employed, and in the conservatory 4-inch pipes. Although the central portion is curved, straight glass has been used, and the colour of the wood-work is of a light tint relieved with blue. The elevation of the building in King Street is in the Italian style of architecture, and, altogether, the building, with its plant decorations, is an ornament to the neighbourhood. We owe this spirited innovation to Mr. Peter Barr, and doubt not that the good idea he has thus boldly illustrated will spread rapidly, and that we shall in due time see beautiful winter gardens on the tops of private houses.



NEW HOUSE-TOP CONSERVATORY.

THE SETTLEMENT OF VINELAND.

By the Founder, CHARLES K. LANDIS.

IN the year 1861, being then about twenty-eight years of age, and full of hope and courage, I conceived the idea of starting a settlement upon virgin land, near the great seaboard markets of America. I decided upon this location, in order to afford the widest and most certain scope for individual success, alike on account of the markets and of the opportunities for skilled labour in farming, gardening, and mechanics. I selected a tract of about 30,000 acres, or about 48 square miles, in the wildest part of New Jersey, on a railroad which had just been completed, but did very little business. On this land I had no resources but the soil itself; the large timber had all been cut off years before, to supply the New York and Philadelphia markets; there was no coal, no iron, and no great navigable stream—nothing to help by way of commercial speculation. Besides, at that time there was no tide of emigration pouring into New Jersey—it all went West. Before my time, small tracts of land would not be sold to strangers, and emigration to that section was discouraged. I knew, therefore, I had no chance help to depend upon, such as ordinarily allures people to new places, but that whatever was won had to be created by industry; yet I believed that if this could be attracted, and then placed in the most favourable condition for its development and increase, all the disadvantages would be overcome. It was necessary for me to create such a state of things that, when the people were brought together from the commencement, and during the progress of the settlement, and after it had become populous, these people should prosper and be contented. The broad design of the settlement was that it should be horticultural, agricultural, manufacturing, commercial, and educational—one object could not well prosper without the others. The first question to be solved was the labour question. On the 8th day of August, 1861, I went upon the railroad, near the centre of the tract of land, and fixed the spot for the city. It was the highest ground, and near the centre of the tract, upon the railroad which ran to Philadelphia. I decided that all my roads should be wide and straight, and at right angles. I would make up for the want of the picturesque in the straight line and the right angle by requiring trees for shade in single or double rows, according to the width, to be planted along all the roads. The engineer drove the centre stake, I cut down the first tree myself, and the axemen then proceeded. During this time an old backwoodsman came up, and, looking at the surveyor's instrument very curiously, asked me what in the world we could be doing. I explained to him that I had just driven the centre stake of a city; that I would at once proceed to open a street 2 miles long and 100 feet wide; and that in ten years' time, upon the spot where he stood, there would be churches, schools, factories, and dwellings, and thousands of population; and around this city for miles and miles would be stretching orchards, vineyards, and farms. The old man saw from my eye that I was in sober earnest, and as I proceeded he moved off farther and farther, and, when at a safe distance, he said, "Young man, I am now old; I have lived here all my life—my father and my grandfather before me. You can never do this thing." Afterwards he went up to one of the axemen, and confidentially told him to be sure and get his money on Saturday night, "as that young man evidently meant well, but was out of his mind." This old man now lives in the city in a corner plot, opposite the public park. The same week I set a large force of men to work, and it was not long before I had a magnificent avenue opened, 2 miles long and 100 feet wide, along the sides of which I left some of the beautiful forest trees for shade. At the end of the first week I decided to take action upon the labour question. I reasoned that it would not be consistent with the good of the place to have any kind of labour degraded—that it would militate against my interest as well as that of the public. That it would be better for me to encourage all labourers, that they might have hope, energy, and sympathy for my efforts, and be able to live in their own freeholds, in order that their prosperity might be a part of the prosperity of the settlement. When my foreman hired the axemen, they said nothing about the amount of pay they were to get—they took it for granted that they were to have the customary pay of the place, which was two shillings per day in store orders upon the shops in Millville. I decided to stop this entirely; therefore, when Saturday night came, I paid them at the rate of four shillings a day in gold. Then the premium on gold was light. I afterwards raised their wages above this. When they received their pay their amazement was inexpressible. One man objected to receiving money, saying he had never used any, and would not know how to spend it. I told him that it was time for him to learn. I made no explanation to these people, only asked them to save all they could, which they promised to do. The next week they worked with great good-will, accomplished much more, and spoke well of Vineland—the name I had decided on. I then told my foreman to give me the names of all the men who were steady and industrious, and had families. When the names were given to me, I called the

men to me, and told them my designs about the place, and that, as they were steady and good men, it would be well for them to have homes which they could call their own, and that I would allow them each to select 10 acres of land at twenty-five dollars per acre, which they could pay for in a term of years, and that I would furnish them with a carpenter and timber, and help them to erect houses for themselves of a cheap but convenient kind, which they could pay for in the same way. I added that they must have no fear of failing—that they must have faith that I would not take the property away from them, but would give them a deed in fee simple, as soon as the land was paid for, and that I would bind myself to do so in writing. They had faith, and went ahead. On off-days and hours they worked for themselves, and cleared their land. The next season they had their crops growing, and this was the nucleus of the settlement, and the way I solved the labour question. I will remark that every one of these men succeeded, and got his deed, and there was not one with whom I had any trouble. At the same time I erected a plain school-house of timber, and at first employed a teacher at my own expense, until there were enough settlers and pupils to organise a school district. My system or plans upon which I founded the settlement may be classed under two heads—the Material and the Moral. In each contract I required that—1. The purchaser should erect a habitation, not nearer than 20 feet from the side of the street, in the city plot, or 75 feet from the roadside, in the country. This got rid of the greatest evil in new countries—speculation, and it made each colonist labour personally to improve his lot and co-operate with his neighbour, and with myself, for our mutual benefit. It also kept the settlement continually growing, and made the outlands successively saleable. The stipulation about setting the houses back removed them from dust, and induced great attention to the ornamenting of front gardens with flowers and shrubbery. 2. That each person in front of his or her homestead, should plant trees for shade at proper distances apart, within one year. My own engineer set the stakes for the trees. This was to turn the uniformity of straight lines and right angles in the roads to a feature of beauty as well as utility. The trees forming long vistas, in time would become surpassingly beautiful; they would also prevent droughts, and make a harbour for birds, which are necessary for a fruit country. As a protection to roads and affording a grateful shade in summer, we all know their value. 3. The next stipulation was that the roadsides should be seeded for Grass within two years, and kept seeded. This was done to add to the beauty and to economise land which ordinarily was allowed to go to waste; as also to prevent the spread of noxious weeds that had been usually allowed to grow up by the roadsides, from whence seeds spread over the adjacent fields. I employed numerous road-gangs to work, and opened through my land 176 miles of road, and built numerous causeways and bridges. This I did at my own expense. I also laid out squares in certain localities for public ornament, and devoted a park of 45 acres adjoining the city plot for the same purpose. These were intended for fairs, festivals, and public amusements. The marsh land I drained by opening the streams and digging ditches through the centre of them. I dug 11 miles of centre or main ditches, which reclaimed a good deal of the best land, and laid bare beds of material which proved to be an excellent fertiliser. But there were other questions which had to be decided at once, or all this work would be lost in the ultimate failure of the settlement. By the laws of the State of New Jersey, cattle were allowed to run at large, and all persons who improved land were compelled to fence their grounds to keep out their neighbours' cattle. This was a wasteful habit. It involved an immense outlay to begin with; also the cost of keeping the fences in repair and the loss of the manure of the cattle. Upon an estimate, I found it would cost over a million of dollars to the settlers to fence the Vineland tract. To keep the fences in repair would cost ten per cent. per annum, which would be 100,000 dollars, and the loss of interest at six per cent. would be 60,000 dollars per annum. I, therefore, got a law passed, prohibiting all cattle from running at large, and repealing the Act requiring fences to be built, so far as it related to my district. People then kept their cattle in enclosures, and soiled them, as the farmers term it; much to the good of the cattle, the saving of manure, and the saving of capital. It also induced them to cultivate root-crops, which added to their wealth and benefited the land. This almost produced a war upon me from the native Jerseymen, who lived around my property; but they have since seen the benefit of it to such a degree that in all the surrounding counties they have followed our example and adopted the same law. Another important question was the economising of manures and sewage. I introduced earth-closets—simply a sliding box under the seats, and a keg of dry earth. This kept all thoroughly deodorised, and the manure was almost immediately suitable for use upon the land, and at the end of the year amounted to considerable value. In the aggregate, in the whole settlement, its money value was very large. I explained to

the colonists that Nature taught us that nothing should go to waste, that these things should be turned to advantages and blessings, instead of being allowed to foul the air and produce typhoid fevers. I had a law passed making it finable in the sum of two hundred dollars to dig any cesspool that would possibly reach the water level of the wells. The sewage was managed in this way:—The farmers disposed of it by running it in receptacles for liquid manure. In the town it was disposed of by running it through a box holding dry manure, sawdust, and sand; the water would run out clear, the filtering matter would retain the fertilising properties, and after a certain time would be emptied and replaced. The central village has a population of 4,000 people, and as you walk through it no noxious smells will ever assail you. The remarkable health of Vineland is, no doubt, greatly owing to this cause. Other towns in the neighbourhood that live under the old system are greatly troubled with fevers and epidemics. If the same system were adopted in London, you would have something more valuable than all the guano beds of the Pacific to keep up the value of your lands. The saving of life would be very great, and the plan is perfectly feasible.

The next thing I will mention is education. In Vineland we have built some twenty school-houses, consisting of primary and grammar schools; and this year we have built a large high-school, as it is called, at a cost of over 30,000 dollars, for teaching the higher branches of education, which school was opened the 22nd of last August by the President of the United States, and most of his Cabinet. The next step will be to connect with all our schools an industrial and technological branch of education, that boys may be trained in physical industry, and have the sciences, and agriculture and horticulture practically taught to them in their everyday work, step by step, in connection with their studies. When the settlement started, most of my land was found to be in the township of Millville. This was soon found to be an inconvenience, and it was important that the main features upon which I founded the settlement should be made a law. I therefore got an Act of the Legislature passed embodying the main features of my plan, and setting off the most of my territory into a separate township. To this Act I have since got supplements passed as they became necessary. The most important principle is that the entire township is governed by a committee of five men, elected annually by the people. I have had no city charter, no alderman, no imposing body of councilmen. I believe the more the governing body is increased in number, the more is individual responsibility divided and lessened. A system of few legislators, with powers strictly defined, who have to appear often for re-election, is what experience has proved to give the greatest satisfaction. This has secured to us a faithful performance of public duties at the lowest possible rate of taxation. In the progress of the settlement, as the number of members belonging to any religious denomination increased, I gave them land, and contributed money towards erecting churches, showing no favour to any creed, and treating all alike; only encouraging a good style of church edifice as far as possible. We have erected Episcopal, Methodist, Presbyterian, Congregational, Baptist, Unitarian, and Swedenborgian churches; some of them are spacious and fine buildings. The Catholics are now building. For the first few years I contributed to the salaries of the clergy. At the first it was necessary to introduce the cultivation of such products as were adapted to our soil and climate and markets. For the produce most sought after in the markets of Philadelphia, New York, and Boston, our soil and climate were well adapted. These were fruits, such as Grapes, Pears, Peaches, Apples, and berries of different varieties; also vegetables, such as Sweet Potatoes (or Yams, as they are called in England), early white Potatoes, table and field Beets, Onions, Lima Beans, Cabbage, Turnips, Cauliflowers, Asparagus, Pippins, and Melons of different varieties. These all grow to perfection, and ripen early. Our people also raised Wheat, Indian Corn, Grass, Millet, and stock for home consumption, but the other articles were raised to send away. I succeeded in getting the settlers to plant extensive orchards and Vineyards; I think there are now at least 1,500 Vineyards and orchards in Vineland, presenting one of the most beautiful sights imaginable. As produce was raised it came to be necessary to market it; and considering that the colonists were strangers in the country, I employed an agent at my own expense, whose duty it was to take their produce to market, dispose of it, and return them the money, free of any charge for his services. In time, as the colonists became acquainted with business and the markets, this became unnecessary, and I withdrew this assistance. As the settlement grew, people who had capital to invest came to Vineland and settled, for the purpose of residence. I noticed that this capital generally sought investment out of Vineland—in the State of New York and other States, where the rate of interest was seven per cent., instead of six per cent., as in the State of New Jersey. I made an effort to have the law, so far as related to my own township, changed, so as to allow seven per cent. interest, but

failed in the Legislature the first session, owing to the prejudices of some of the members. The next session I was more successful, and the Act was extended to the entire State, much to the advantage of Vineland, and the rest of New Jersey. This alone gave an impetus to industry beyond what many believed possible. After the settlement had so grown as to number some thousands of inhabitants, and had a great deal of produce to send to market, we had reason to complain of the high charges for freight upon our single railroad. I remonstrated with the company, and received from its general manager fair promises about reduction, but these were not fulfilled. I then, with much difficulty obtained a charter from the State Legislature for a new railroad leading direct to New York and Baltimore. After a struggle of five years, I succeeded in getting this new railroad constructed, when there was an immediate fall in the rates upon both railroads. Then more produce was raised, and manufacturers came in, who before were deterred on account of the high rates of freight. The construction of the latter railroad increased the trackage through the Vineland territory, from 8 to 17 miles, adding vastly to the value of property, as well as to the prosperity of the people, and affording new outlets.

There is a material and industrial prosperity existing in Vineland, which, though I say it myself, is unexampled in the history of colonisation, and must be due to more than ordinary causes. The influence of temperance upon the health and industry of the people is no doubt one great cause. The settlement has built twenty fine school-houses, ten churches, and kept up one of the finest systems of road improvements, measuring 178 miles in the country. There are now some fifteen manufacturing establishments on the Vineland tract, and they are constantly increasing in number. Her stores in extent and building will rival any other place in South Jersey. There are four post-offices in the tract. Out of seventy-seven townships in the State, by the census of 1869 Landis township ranked the fourth in the value of its horticultural-agricultural productions. There are 17 miles of railway upon the tract, embracing six railway stations. The amount of products sent away to market is enormous. Her fruits are to be seen in all the large eastern cities, from Philadelphia to Quebec. There is more fruit raised in Vineland than anywhere else in the United States upon the same area of land. To drive through the place over the smooth and beautiful roads, lined with young shade trees, and bordered with green, and past her thousands of orchards and Vineyards, is like driving through the loveliest of parks.—“Fraser's Magazine.”

[The above is but an abstract of a very interesting paper on Mr. Landis's remarkable settlement.]

TREES AND SHRUBS.

NEW CONIFERS AND THEIR SYNONYMS.

MR. MEEHAN seems anxious to diminish the number of nature-stamped species of Conifers by massing several of them into one. According to your impression of March 13, he makes five or six admittedly distinct species of *Picea* to be but one species—namely, *P. grandis*—or, at best, only varieties of it; and he would have added another to the list—namely, *P. concolor*—but hesitates to do so out of regard for the discriminating powers of Dr. Englemann, who considers it to be a distinct species. He, however, concludes that “*Picea bifolia* and *P. magnifica* of Murray, and *P. violacea* of Roetzl, will probably have to go back to *P. grandis*, as *P. amabilis*, *P. lasiocarpa*, and *P. Parsonsiana* have had to do.” I was not before aware that anyone had pronounced such forms as *P. amabilis* and *P. Parsonsiana* (*Pattoniana*, *Lowiana*, or *lasiocarpa*) to be the same as, or slightly altered forms of, *P. grandis*; neither do I think that any qualified botanist will ever pronounce *P. magnifica* of Murray to be the same as *P. grandis*; unless, perhaps, he manages to institute a new and different definition of what constitutes a species and what a variety. In the meantime, however, it is enough for us to know that *Picea Parsonsiana*, *amabilis*, *magnifica*, and *grandis* are nature-stamped species, inasmuch as they severally possess distinctive or peculiar characters, which are almost invariably transmitted to their seedling offspring. The following comparison of their leaves, and their arrangement on the branches, will probably justify a specific distinction:

P. GRANDIS.—Leaves, rather closely arranged, in two double horizontal rows or tiers, on each side of the branches, those composing the upper tiers being from half an inch to three-quarters of an inch long, while those of the under tiers measure from 1 to 1½ inch long, and all of the same width (one-twelfth

of an inch), somewhat linear, on short twisted foot-stalks, blunt and emarginate at the points, grooved from base to point, and of a deep glossy green on the upper face, while the under face is slightly raised along the middle, and striped with two bright silvery bands.

P. PARSONSIANA.—Leaves, thinly disposed, in two very distinct lateral rows on the branches, falcate, or at first spreading, then turning upward and inward, somewhat linear, nearly uniformly long, from 2 to $2\frac{1}{2}$ inches by one-tenth of an inch broad, generally slightly notched at the point, and on short twisted foot-stalks; channelled for about two-thirds their length, but in some instances from base to point, with a distinct and never-failing broad band of pallid stomata along the middle of the upper face; which is of a light green colour, slightly raised, and with two white bands on each side of the midrib on the under face.

PICEA AMABILIS.—Leaves, densely arranged along the sides and upper face of the branches, those on the upper face being generally much incurved, flat, blunt, and evenly notched at the points, from three-quarters of an inch to $1\frac{1}{4}$ inch long by one-twelfth of an inch wide at the point, from which they gradually narrow to a rather long slightly-twisted foot-stalk, deeply channelled, and of a dull dark green on the upper face, while the underside is slightly raised and striped with two broad bright silvery bands.

P. MAGNIFICA.—Leaves, densely disposed along the sides and upper face of the branches, falcate, slightly adpressed and turned upward, somewhat four-sided, linear, blunt pointed, from three-quarters of an inch to $1\frac{1}{4}$ inch long by about one-sixteenth of an inch wide, of a dull dark green above, and striped with two faint white bands below.

Why, then, does Mr. Meehan refer these forms to *Picea grandis*? Are we to understand that they originally sprang from that kind, or that in accordance with his own hypothesis, they are the result of a cross between *Picea grandis* and another very distinct species—say, *P. nobilis*? Considering that *P. grandis* and *P. Parsonsi* each possess peculiar structural characters, which are almost invariably transmitted to their offspring, we must conclude that they are both deserving of specific names. That Mr. Meehan should be at fault in this matter, however, need not surprise us, seeing that both Mr. Gordon and Mr. Murray give, now and then, imperfect descriptions of some of our Conifers. Mr. Murray, indeed, has lately admitted that he cannot distinguish the leaves of *P. magnifica* from those of *P. nobilis*; and Mr.

Gordon, in the first edition of his "Pinetum," in describing the leaves of *Picea grandis* and *amabilis*, entirely overlooks the fact of their being deeply grooved along the upper face; but I am happy to see by the second edition of his "Pinetum," just published, that, in the case of one of these species the mistake is corrected. It is also rather odd that Mr. Gordon, who was the first to popularly describe *Picea Lowiana* (as he called it) should still persist in saying that it has straight leaves, when every one who knows the plant could testify to the contrary being the case. It has most decidedly falcate leaves. Indeed I have only seen four plants of it that had

straight leaves, three of which were growing in the shade of large Elms and Scotch Pines. He also fails to credit it with having a band of pallid stomata along the middle of the upper face of the leaves. And allow me to correct the statement that it is only "found in valleys, or along the alluvial banks of rivers; never as a mountain tree." I have myself gathered specimens of it from trees growing on the high ridges or bluffs, high up on the western slope of the Sierra Nevada Mountains; and I have had hundreds of good-sized plants sent to me to the lowlands of California that were dug out of the steep slopes of the ravines of the Sierra Nevada. GEO. SYME.

Elvaston Nurseries,
Borrowash.



Keteleer's Guelder-Rose.

KETELEER'S GUELDER-ROSE.

(*VIBURNUM KETELEERI*.)

THIS *Viburnum* forms a bushy shrub rarely exceeding 3 feet in height. Like *V. macrocephalum*, to which it is related, it blossoms from April to May. It yields seeds freely, but, in the absence of these, it may be propagated by means of cuttings made of half-ripened wood placed under a cloche. It may also be easily multiplied by grafting, selecting for a stock either *V. lantana* or *V. opulus*, or some of its varieties. Plants of this Guelder Rose should be treated in every respect like those of *Viburnum macrocephalum*.

It is sufficiently hardy to be grown out of doors; but in cases of extreme cold it is prudent to give it some slight protection. A light soil that is dry, warm, and calcareous, appears to suit it best. This *Viburnum* came originally from China, and we owe its introduction to a rather peculiar circumstance. Horticulturists of the present day are aware that the *V. macrocephalum* is with difficulty reproduced from cuttings, and that grafting is almost the only way by which it can be increased. That the Chinese were acquainted with this peculiarity of the plant may be inferred from the fact that some stems of it which were introduced from China were found to be grafted. A few years ago these might have been seen at MM. Thibaut & Keteleer's. The stock upon which this variety was

grafted having pushed growth, M. Keteleer obtained cuttings from it and gave one to M. Carrière, who planted it in the open air, and the following year it produced a dozen clusters of flowers, one of which was the original of the accompanying illustration. M. Carrière remarks, in the "Revue Horticole," in reference to this plant, that although it has been named *V. Keteleeri*, it should, properly speaking, bear the name of *V. Keteleeri macrocephalum*.

POPLARS AND THEIR FOES.

POPLARS constitute a well-known genus of trees belonging to the Willow family (*Salicaceæ*), and are extensively distributed over the northern hemisphere. As ornamental trees, they are cultivated throughout almost the whole of Europe, and in Siberia and other parts of Asia; they are highly valued for their timber. They are remarkable for rapidity of growth, and all of them are well suited for planting in parks.

The White or Silver Poplar.

This, the most valuable species in this country, is a native of northern Asia. It has a tall, erect, and tapering trunk, from 95 to 110 feet high, and from 3 to 6 feet in diameter. Occasionally individuals, more than 30 feet in circumference at the base, may be met with. The branches are slender and rod-like, have a strong upward tendency, and form an elegant crown. The bark is a light ash-grey in colour and smooth, except upon old trees, where it is split and rent in all directions. The leaves are about $3\frac{1}{2}$ inches long, by $2\frac{1}{2}$ broad, and depend from the small twigs upon long slender petioles, which are covered with a white, soft, woolly material. They are alternate, sharp-pointed, ovate, and serrated, and of a bright green colour; the under surface of each leaf is covered with a short cotton-like substance. The leaves wither and fall off early in autumn. The flowers are amentaceous or in the form of catkins, and appear early in spring, before the leaves begin to expand. The male and female catkins grow upon distinct trees, and consequently, when individuals of one sex stand isolated their seeds are sterile. The male flowers consist of a number of loosely connected florets, each with eight stamens. They wither and fall off as soon as the pollen is emitted. The female catkins do not differ much in appearance from the male. Each floret contains an oval-pointed ovule, a very short pistil, and a quadripartite stigma. The seeds, which are ripe in June, consist of small, oval, curved capsules each of which contains a number of small, black, oval seeds, furnished with woolly tufts. The culture of this species of Poplar has greatly extended in Great Britain during the last few decades. It grows rapidly, and is of great value in districts where there is a scarcity of timber. In Asia, its timber is largely used in house-buildings, for which it is said to be well adapted, being durable, and little affected by atmospheric influences. When the tree is young the timber is soft and white, but, when old, it becomes hard and of a brownish hue. In this country it is chiefly employed for making wooden utensils and trays. The White Poplar thrives best in a rich soft soil, with a surface stratum of moist humus. The best method of propagating it is by cuttings or scions, as the development of young trees from seeds is a very tedious process. The cuttings should be planted in March in a damp soil, and the scions about the end of autumn. The young roots should be carefully protected from frost. This species of Poplar is very common in Germany and Italy. It seems, according to report, to have been a favourite ornament of the parks and pleasure-grounds of the ancient Romans.

The Common or Black Poplar.

This well-known tree is found in almost every part of the United Kingdom. Its leaves, which are 3 inches long, by 2 inches broad, are almost triangular in form, thick, and tough in texture, and grass-green in colour. It is a very rapid-growing tree, and in a rich fresh soil frequently rivals the Oak in size. The bark is ash-grey, but upon the branches and young trees it is of a light yellowish tint. The leaf-buds are sharp-pointed, thick, and glutinous, and emit a strong balsamic odour when bruised. Bees are very fond of this tree, and it is said that they obtain material for wax from its leaves. The truth of this belief is very questionable. A few Black Poplars, however, should always be planted in the immediate vicinity

of gardens where bees are kept. The Black and White Poplars are also admirably adapted for nurse trees to young plantations and shrubberies, especially in the vicinity of towns. The Black Poplar is well adapted for planting in damp boggy soils, and it thrives exceedingly well upon the banks of rivers and lakes. The wood is soft, tough, and difficult to split. The larger roots are beautifully veined, and, in some places, are used for inlaying work. Upon the Continent, the wool found upon the seeds is not unfrequently used, with the addition of some cotton, in the manufacture of bed-covers, mats, gloves, and stockings.

The Aspen.

The Aspen (*Populus tremula*) is of very little value, except as an ornamental tree. The wood is soft and useless, and is not even adapted for fuel. The leaves are ovate and serrated, and depend upon petioles so long and slender that the slightest breath of wind sets them in motion. The Aspen generally attains a great height and circumference. The trunk is usually from 90 to 100 feet in height, with a diameter of 6 or 10 feet. In the Pessbar Forest, in Hungary, there are several Aspens whose trunks are not less than 110 feet high, and some 15 feet in diameter.

Other Species.

There are several other species of Poplar, chiefly indigenous to North America and Asia. One of the handsomest and most valuable of these is the Balsam Poplar (*Populus balsamifera*), an American species, which has been acclimatised in this country. The leaves are about 5 inches long by 3 inches broad, sharp-pointed, deeply serrated, and of a light green colour. The fresh young leaves of this tree, when applied to external inflammations, are said to produce a very beneficial and cooling effect. When the buds are distilled in spirits or strong brandy, before they begin to expand, a glutinous balsam is obtained, which is said to be very valuable in surgery. The wood of this tree is comparatively worthless; but it has a handsome green foliage, and forms a very beautiful object in the landscape. It is propagated by cuttings, and grows very quickly. It thrives best in a damp mild humus, with a sub-soil of moist boggy earth; if planted in a dry sandy soil, it almost invariably dies. The Balsam Poplar suffers much from the ravages of insects, which pierce the wood. The Laurel-leaved Poplar (*Populus laurifolia*) is a variety of this species. It is a native of Siberia, and is characterised by the smallness and dark colour of its leaves. Besides those, there are still several other kinds of Poplar to which attention may be directed, and amongst which may be mentioned the Grey Poplar and the Libyan Poplar. A very handsome variety of the latter is the *Populus bicolor*, so called from the circumstance of the upper surface of its leaves being white, whilst the under surface is green. The habits of this tree are the same as those of the White Poplar, and it is well adapted for cultivation in this country. The Italian or Lombardy Poplar (*Populus dilatata*) is a native of the plain of the Po. It is distinguished chiefly by its close handsome pyramidal crown. The trunk attains a height of 60 feet, and a diameter of 2 feet. The branches are long and slender, and but sparingly clothed with foliage, which, in form and colour, resembles that of the Black Poplar. This tree still abounds in the plains of Lombardy and Venice, where its timber is extensively used for flooring.

Insects that infest Poplars.

All species of the Poplar tribe are liable to the ravages of insects, of which the most destructive are as follow:—*Chrysomela populi*, which, in its grub state, feeds upon the foliage of the trees from June until August, and passes through the chrysalis stage upon the leaves. It is of a steel-blue colour, and is chiefly found upon Aspens. *Melolontha hippocastani* is scarcely distinguishable from the common cockchafer. *Melolontha horticola* is a very destructive insect, and attacks all kinds of trees and shrubs, of which it devours the leaves, blossoms, and even fruits. Its ravages begin in the month of June. *Cerambyx carcharias* is found only upon Poplars. *Cerambyx populneus* lays its eggs in rents in the bark, whence the grubs bore into the wood. *Chrysomela quadripunctata* attacks not only Poplars, but also Oaks, Alders, Willows, Birches, and Hazels.

JOHN HUTCHINSON, M.A.

A SMALL GREENHOUSE LAMP-STOVE.

A CHEAP and good method of heating pits, frames, and small greenhouses has long been wanted by those who grow a few common decorative plants. Gas possesses great heating power, and is not difficult to manage; but, on the other hand, when it escapes or when combustion is incomplete, it is fatal to plant life. Candles have been used to exclude frost from tender bedding plants in frames; but these, unless used in large quantities, do not throw off sufficient heat for that purpose. One of the best of all appliances of this kind, for heating small areas, has been sent us by Messrs. Dietz, of Carter Lane, St. Paul's; it consists of a strong paraffin lamp, which burns pure rock-oil, and generates no gases injurious to plant life. This little stove consists of a paragon burner, set in the base of a metal cylinder, with a metal in lieu of a glass chimney. A double casing is given to the oil-well, so that the heat of the wick tube cannot be transmitted to the oil. A great heat is generated, and in a couple of hours the temperature of a greenhouse or room can be raised between 20° to 30°. By removing the outer casing, and substituting a glass chimney, the stove becomes a lamp. We give a view of this very useful stove.



A small Lamp-stove.

THE AMATEUR AND THE AURICULAS.

ONE of the pet flowers of amateurs is the Auricula. Happy the flowers which have escaped savants and amateurs; they have not received ridiculous names; they are not tormented, distorted, or subjected to a thousand whimsical exigencies; they blossom in peace. The learned require that the Auricula should be yellow; if it presents itself clothed in any other colour it is pronounced a monster, as double Roses are. Amateurs grant it permission to wear what colours it pleases; but this is only an appearance of liberty. I once saw an amateur in a state of fury. Some Auriculas had been sent to him from I don't know what country: he had cultivated them with care; he had tormented them after the methods most approved of by amateurs; he had deprived them of water, and more particularly of sun and earth, by placing them in a pot, and as I went into his house he was tearing them up, one by one, and trampling them under his feet. I understood, from his broken exclamations, that the Auriculas had avenged themselves for the ill treatment they had received, by not fulfilling the conditions he required and had hoped for. I, however, ventured a few questions to assure myself of the fact, and at the same time to learn what horrible offence could have been committed by these poor flowers, which appeared to me to be decked with the richest colours, and to be in perfection. He continued his execution, pronouncing upon everyone his motives of judgment and condemnation, before he crushed it under his feet. I will place you in a condition to do as I did, and to derive instruction; that is to say, to learn what are the duties of the Auricula towards its cultivator, and how it transgresses them. He took up one of a beautiful velvety blue. Its stalk is too short, said he, and he crushed it. To this succeeded another of a rich velvet-brown, with a white circle which is called the eye; its stalk is too long—crushed. A velvet-orange; the flower is not exactly round—crushed. A deep purple-velvet; the bouquet has only eight flowers; it ought to have twelve—crushed. A velvet-olive; the eye slimy (that is to say, it is slightly tinged with the olive colour)—crushed. A velvet-yellow; the eye does not occupy a third of the circumference of the flower; that is the least it ought possibly to do; I have a friend who requires half—I am more indulgent, but I cannot admit this—crushed. A velvet pale violet; the eye is not exactly round—crushed. A deep violet-velvet; eh! what do you do here? your clou exceeds your paillettes, a pretty thing that! Here I stopped the judge and executioner to request an explanation. Auricula fanciers call the pistils the clou, and the stamens the paillettes. The stamens ought to extend beyond the pistils, and appear alone; it is a very serious thing when the contrary happens to be the case. Whatever may be the colour or the splendour of the flower, a true amateur would scorn to keep such a one in his collection. A hundred charming flowers were thus sacrificed before my eyes. I in vain endeavoured to save them by begging that he would make me a present of them; my entreaty was rejected. "Not at all, not at all; I will give you some others." "But these please me very much." "Nonsense; you are joking!"

"Not at all, I assure you." "I cannot consent that such flowers should come from me; if it were known that I had given them I should subject either my collection or my friendship to animadversion." He was inflexible. Do not imagine that I invent or exaggerate; seek for an amateur of Auriculas, and read to him this passage of my letters. I can assure you beforehand that he will not smile, that he will see nothing ridiculous in it, that he will say his brother amateur was right, perhaps even a little too indulgent. In addition to the florist's lesson, this is a chapter to add to the rights of man. You now know what are the duties of Auriculas, and I hope you will see how to make them perform them.

ALPHONSE KARR.

GARDENING FOR THE WEEK.

Kitchen Garden.

Late Peas.—In the majority of soils these are best sown in trenches made something similar to those for Celery, and I allude to this matter now because I have generally found it to be an advantage to have the trenches prepared a month or six weeks before it is necessary to sow the Peas, especially if the summer should turn out to be dry. In gardens, however, where close and continuous cropping must be adopted, it is often requisite that late Peas should follow Broccoli or some other crops, that cannot be removed till just before the ground is required for the Peas, and, in that case, if it is possible to clear off a row here and there at suitable intervals apart, it will be advisable to do so. In planting the Broccoli, by marking where the Pea rows will come, and at each of those places planting a row of some kind of Broccoli that will turn in during March or April, making some little allowance for the variation of the seasons, this might easily be done. In preparing trenches for Peas, they should be, if possible, from 15 to 18 inches wide and 1 foot deep, and from 4 to 6 inches of manure should be placed in the bottom of them, and thoroughly incorporated with the next foot of soil beneath. Some portion of the soil taken out should then be returned in order that the trench may not be more than 6 inches below the level of the surrounding soil. This will be ample for watering, and deeper trenches only lessen the depth of soil available for the roots of the plants. The thorough and deep incorporation of the manure in the bottom of the trenches is, however, an important matter, as it tends to encourage the roots to descend beyond the influence of heat and drought, and, consequently, they are rendered less liable to the attacks of mildew. Where sticks are easily obtained, tall Peas are better than dwarf ones, and *Ne Plus Ultra*, of tall kinds, and *British Queen*, are still two of the best, and for late use they may be planted in quantities at intervals of a fortnight from the 1st of May till the middle of June. Without wishing to endorse all that has been written in favour of what is called double cropping, in the matter of late Peas I have practised it to some extent in the following way with considerable advantage:—At this season, when we are planting the main crop of Potatoes, in setting out the rows, which are usually 2½ feet, about every 5 yards or so, a space of 3 feet is left vacant for a row of Peas, and in the centre of those spaces the Pea trenches are prepared before the Potatoes are planted; thus when the time comes for sowing the Peas all that is necessary is to set a line and draw a drill 6 inches wide along the centre, plant the Peas 2 inches apart all over the drill and cover with 2 inches of soil. If the weather should be very dry, the drills should be well watered before planting. I have invariably found the rows of Peas amongst the Potatoes to be more productive and more lasting than others in another part of the garden where the rows were placed side by side; but the free and abundant circulation of air on all sides will easily account for this superiority.

Early Celery.—Early sown Celery should now, or very soon, be pricked off into boxes from 2 to 3 inches apart, and be placed in a frame where a little steady bottom-heat can be furnished, and kept close for a few days; checks of all kinds must be guarded against or all labour will be thrown away by the plants "bolting" when they ought to be coming into use. A sowing of Celery should now be made for the main crop in a slight hot-bed. A good red and a good pink kind may be had in *Williams's Matchless Red*, and the *Sulham Prize*, or *Ivery's Pink*. In addition to sowing those kinds in gentle heat, sow a little at the same time thinly in the open air, in the best soil available. If a very warm spot is vacant at the foot of a south wall, sow a row of French Beans, about 4 or 5 inches from the wall, in a shallow trench; they can be easily protected on cold nights in such a position, and will come in at least a fortnight earlier than others sown in more exposed situations. In the neighbourhood of rookeries, rooks and jackdaws are often troublesome at this season, and will, if not looked

after, dig up and carry off Potatoes, Peas, Beans, and other seeds. I never destroy life except it is absolutely necessary, but I am compelled in self-defence to shoot a jackdaw now and then, and to lay it on fresh planted crops outside the walled garden. If a dead jackdaw is laid on the ground, breast downwards and the wings pegged out, I will guarantee no living one will settle on that land again while his body remains in sight. Sow in a gentle heat Basil and Sweet Marjoram for transplanting in the open air in May. These are largely used, therefore provision should now be made for a good supply of them. The roots of Tarragon should also be divided and re-planted; this is apt to go off in wet heavy soil, and, where this is the case, cuttings of the forced shoots will root at this season in heat, and a stock of young plants may soon be obtained. Sow Vegetable Marrow in a warm frame, three seeds in a 48-sized pot, filling the pots only two-thirds full of soil. Allow room for earthing up the plants. A part of the land might be planted by having the hills prepared, and the seeds put in under hand-lights, about the middle of the month, where they are intended to remain.—E. HOBDAV, *Ramsay Abbey*.

Indoor Fruit Department.

Vines.—Fruit on the earliest pot Vines will, in some instances, have been cut during the past week. As soon as it is all removed from one rod it should be thrown out, and another, not so far advanced, substituted. Few Vines are worth keeping to fruit a second time in a pot, as unfruited or maiden canes always give far more satisfaction. When the eyes of any new or valuable variety, which has been fruited in a pot, are likely to be scarce, the plants must be looked after until they are thoroughly matured and ready to cut off. Encourage the growth of late Vines when they seem willing to grow, as no good is derived by starving them in a low temperature, in order to start them at a fixed date. That the fruit may be thoroughly ripe, and in a fit condition for keeping throughout the winter, all Vines should be in growing order by the first week in April. To start early and ripen early is a much better practice than starting late, and leaving the ripening a matter of uncertainty. As Vines break more evenly now than during the short days and long nights, it is not necessary to let the upper half of the rod remain untied and hanging down; but they may be tied into their allotments without delay. Rather than smother any promising piece of young wood of last year's growth with side shoots from neighbouring rods, keep all such well pinched in, especially those not bearing fruit. Indeed, it is generally the best plan to restrict shoots not in fruit to within two eyes from the main stem, and to give those with bunches attached the benefit of more light. The atmosphere about Grapes in the early Vineries may, with advantage to the flavour, be kept in a drier condition as soon as a change of colour is perceptible in the fruit.

Pines.—Much care is still necessary in watering all kinds of Pines so as not to overwater, and thus cause a sour condition of the soil about the roots. When lately-potted plants have been watered, after the operation some weeks often elapse before they need it again; for the second, as well as the first watering, clean water only should be used, as it is not safe to use powerful stimulants until the roots are plentiful at the outside of the ball. Pine stoves directly facing the sun require to be slightly shaded during the warmest part of the day about this time. A thin piece of canvas laid temporarily on the glass when the sun is strongest is sufficient for a time, but by-and-bye shading must be kept continually on, and then it is the best and cheapest way to paint the roof sashes with a mixture of milk and whiting, which should be worked up to the consistency of paint, and put on with a brush upon a hot day, when it dries quickly and firmly, is always neat, and remains on until shading can be dispensed with in the autumn.—J. MUIR.

Flower Garden and Pleasure Grounds.

Of all the coloured-leaved plants used for the decoration of the flower garden during the summer months the most beautiful are the various species of the Brazilian *Alternantheras*, and of these the loveliest and also the most delicate of all are *A. amoena*, and its somewhat improved variety, *A. amoena spectabile*. The entire species, however, are indispensable in the flower garden, more particularly where carpet-bedding is practised. It is generally found to be difficult to induce these plants to grow so as to furnish cuttings during winter and early spring, but if the stock of old plants or store pots are now introduced into a brisk bottom-heat they will rapidly furnish the necessary material for this purpose, and the cuttings will strike root very freely if placed in a close propagating case; and, after being gradually hardened off, will be ready to be turned into the flower-beds by the beginning of June, which is as early as this plant, together with the *Coleuses*, *Iresines*, &c., can be trusted in the open air. Where it is intended to use any of the fine varieties of the garden Beet as an edging to flower-beds, or

in ribbon-borders, &c., the seeds should be sown now, and the plants, when large enough to handle, should be thinned out to a distance of 6 inches from plant to plant; or the seeds may be sown in pans, from which they may be transplanted. The first-named method, however, is the best, as they are not found to transplant well, more particularly should very dry weather set in about the time this is attempted. If a good variety of this plant is obtained, it will be found that there are few, if any dark foliaged plants, which will surpass, or even equal in richness of colour, or which are better suited to special decorative purposes, than this culinary plant. The rich metallic hue of its ample foliage harmonising perfectly with the *Centaurea* and other white-foliaged plants, as well as with the Golden Feather *Pyrethrum*, *Stellaria graminea aurea*, &c. The present is the most suitable time for sowing annual flower seeds of all kinds in order that they may flower throughout the summer months, and this may be done in the open air where they are intended to bloom or in seed-pans under glass, to be pricked out into other pans or boxes, and finally transplanted into the open air; the latter method, on account of the seeds of many varieties being so exceedingly small, is in most cases the most advisable; the comparatively larger kinds, such as the Sweet Pea, the *Tropæolum*, &c., and *Mignonette*, which does not transplant well, may be sown where they are now intended to flower. There are many annual flowers which, on account of their ephemeral character and somewhat weedy aspect, are, to a great extent, excluded from the flower garden. The bedding-out system has also had much to do with this result, and the circumstance, as regards many of them, is not to be regretted; while, on the other hand, there are many varieties which will, as it were, continue to assert their right to a position in every garden.

Select Annuals.

Among these may be mentioned improved varieties of French and German Asters, Ten-week and other Stocks, besides *Mignonette*, which, on account of its delightful perfume, will always be in favour. During the last few years greatly-improved varieties of this plant have been introduced to the public, which are found to be quite as sweet-scented as the old sort. There are also the various and beautiful varieties of the *Phlox Drummondii*, many of which are exceedingly pretty; the *Zinnia elegans*, which of late years has been greatly improved, and is well deserving the consideration it now obtains. Many of the everlasting are also well worthy of cultivation, such as *Rhodanthe Manglesii*, *Helichrysums*, *Xeranthemums*, &c., together with *Dianthus Heddewigii* and its many varieties, the dwarf and beautiful *Candelabra Larkspurs*. Some of the dwarf French Marigolds, such as *Tagetes aurea floribunda* and *Tagetes signata pumila* are, from their dwarf and compact habit of growth, their profuse and long-continued flowering, even valuable as bedding plants. *Gaillardia picta*, *Godetia Whitneyi* and *Dunnetti*, *Linum grandiflorum*, *Viscaria cœrulea*, &c., are all showy and useful annual flowers; while, from the description of the new *Romneya Coulterii*, it appears to be a remarkably beautiful flower, and may probably be found to be useful for the production of blooms for cutting, as well as for the decoration of the flower garden. Among dwarf or trailing annual plants the following will be found valuable. *Abronia umbellata* and *Abronia grandiflora*, producing *Verbena*-like clusters of bloom throughout the summer months, and *Portulacas* of many colours, with double, as well as single flowers. These plants are admirably adapted for a warm sunny border, on poor or light gravelly soil, producing, as they do, throughout the summer months a long succession of truly brilliant flowers. *Clintonia pulchella* is also a very beautiful dwarf-growing annual, producing a profusion of brilliant-coloured *Lobelia*-like blooms, *Sanvitalia procumbens*, is an old favourite dwarf annual flower, which continues to bloom throughout the summer months, the flowers being yellow with a black centre; and there is also a double-flowered variety, in which the black disc entirely disappears. *Leptosiphon roseus* is another exceedingly dwarf and beautiful annual, seldom more than 3 or 4 inches in height, and producing a profusion of terminal clusters of rose-coloured flowers during the summer. It requires tolerably rich soil, but when it can be induced to do well it is one of the most beautiful of annual flowers. There are also several climbing annuals which are found to be exceedingly useful for the summer decoration of the flower garden, in covering trellis work of all kinds, and can be made to form graceful festoon-like wreaths of gay-coloured flowers throughout the summer months. Among the most suitable plants for this purpose are the following, viz.:—The "Morning Glory" or the *Convolvulus major*, and its still more beautiful striped blooms, which it unfolds with the early morning light; hence its trivial though appropriate name. Several of the closely allied species of *Ipomœa* are also well suited to this purpose, together with *Tropæolums*, *Eccremocarpus*, *Lophospermums*, *Loasas*, *Maurandias*,

&c. It is sometimes desirable, during the summer months, to shut out or conceal certain objects which may be considered unsightly or not in character with their surroundings, and this concealment can generally be effected by the use of climbing annual plants, such as the Scarlet Runner, &c. A very effective and ornamental screen may also be formed by such annuals as the *Tropæolum canariense*, *Convolvulus major* and *C. major picturatus*, and the various kinds of Sweet Peas, which should all be sown in one drill, and the plants should have supports as soon as they require them, in the form of stakes such as are used for the taller kinds of Marrow Peas, for the *Tropæolum* and the *Convolvulus* will grow to any desired height, and will ultimately overpower the Sweet Peas, which will, however, come into flower first, and will be succeeded by the *Convolvulus* and the *Tropæolum*, both of which will continue to flower until they are destroyed along with other tender bedding plants by the frosts of October. The effect produced by the gay-coloured flowers of *Convolvulus* and the pale yellow blooms of the Canary-flower, with Sweet Peas of various shades, will be found to be very remarkable and by no means unpleasing. Patches of the more hardy annual flowers may also be sown now on the margins of shrubberies and similar situations wherever there may be found sufficient space for doing so; and the most compact-growing and dwarf sorts should be kept near the front, while taller kinds may occupy the background. Plenty of Mignonette, however, should be used for this purpose, as this plant is not only very ornamental but, on account of its delicious perfume, is very much appreciated.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Orchids.

The East India-house this month should have a night temperature of 68°, and should be allowed to rise to 80° by day in bright weather. In the Mexican-house the night-heat should be 62°, and that by day, if bright, 75°. The temperature for the *Odontoglossum*-house should be 50° at night, and it may be allowed to rise to 60° on bright days, and for the benefit of all freshly-potted plants little air should be given until they have made plenty of fresh roots. Where evaporating troughs are used on the pipes, they should be kept filled with water to create more moisture in the house—treatment which will tend very much to keep the plants from shrivelling. Syringe the leaves of *Aërides* and *Vandas*, once a day, an operation in which great care will be required to prevent the water from getting into the centre of the plants. *Cattleyas* should be watered sparingly until they have made plenty of roots. *Odontoglossum Bluntii* and *Oncidium macranthum* should be liberally supplied with water, and a sprinkling of it over their leaves on bright days will add to their health and vigour. *Disa grandiflora* should be sprinkled with water at least twice a day, an operation which must not be neglected as the weather becomes warmer. Plants of *Dendrobium chrysanthum*, that have made growths 2 feet long, would be benefited by being watered with weak liquid manure once a week. Nearly all *Dendrobiums* enjoy a warm atmosphere while growing, and if kept too dry many of them are subject to red spider. *Pleiones* must not be allowed to suffer from want of water, and as they advance in growth they should be watered with weak liquid manure twice a week. *Masdevallias* will require great care as regards watering until they have made young growths from 2 to 3 inches in length. Many of the varieties will be in flower this month, and we shall no doubt hear of some wonderful varieties occurring in the Harryana section, which is one that should be grown in large quantities, as the colour harmonises so well with that of other Orchids, particularly with *Phalænopsis* and *Odontoglossum*, both cut and otherwise. In the case of plants that have scales on them, no time should be lost in eradicating it before they begin to make growth, for if this is neglected they will not make healthy plants. *Aërides*, *Saccolabiums*, and *Vandas*, are subject to small brown scales, which attach themselves to the edges of the underparts of the leaves, and which are so small as to be easily over-looked. Where these appear, wash the leaves with weak tobacco-water and soft soap mixed together, and applied with a soft sponge; never use a brush. Fumigate often, as it is better to do so frequently than to be compelled to over-fill the house with smoke, which might injure some of the plants. Orchid-houses will now be gay with *Epidendrum atro-purpureum*, *Dendrobium Devonianum*, *D. Wardianum*, *D. infundibulum*, *D. Cambridgeanum*, *D. fimbriatum*, &c., *Leptotes serrulata*, *Lycastes*, *Cypripediums*, *Trichopilias*, *Oncidium leucochilum*, *O. flexuosum*, *Odontoglossum Alexandræ*, *Saccolabium giganteum*, *Phalænopsis grandiflora*, *P. Schilleriana*, *Vandas*, and other kinds.—E. CULLEY.

The Sextus Potato.—This is one of the best late Potatoes grown. It is so disinclined to sprout in spring that it may be kept until June in a suitable place. It is nearly disease-proof, a capital cropper, and so good in quality that it may be described as a rich Potato. There are fifty good sorts I would lose rather than this.—S. H., in "Gardeners' Magazine."

SOCIETIES AND EXHIBITIONS.

ROYAL BOTANIC SOCIETY.

MARCH 31st.

Spring Exhibition.

THIS show was fully up to average exhibitions of the kind in former years, and, the weather being all that could be desired, it was well attended. Hyacinths were fairly represented, Messrs. Cutbush, Barr & Sugden, and Carter & Co. being exhibitors in the nurserymen's classes; while Mr. Douglas represented the amateur growers. Messrs. Paul & Son's collection of pot Roses, Mr. W. Paul's Camellias, and Mr. Charles Turner's collection of Ivy in pots, and standard Aucubas profusely laden with brilliant fruit, contributed very materially to the attractions of the exhibition. The Society's conservatory, which is always interesting, is now unusually so, being well furnished with spring flowers, and a magnificent specimen of *Rhododendron Countess of Haddington*, although rather past its best, is still covered with its large waxy white blossoms.

Hyacinths and Tulips.—In both of these Mr. J. Douglas, of Loxford, had well-grown examples; but, as the varieties differed little from those named in our report of the South Kensington exhibition, on March 17th, there is no need to describe them here. In the nurserymen's classes, among the white varieties, the following Hyacinths were in excellent condition, viz.:—*Mont Blanc*, *La Grandesse*, *Madame Van Der Hoop*, and *Miss Nightingale*. Prominent among the blues were *Marie*, a dense and effective variety; *Charles Dickens*, a good bluish-lilac; *King of the Blues*, a fine dense dark blue; *Grand Lilas*, bright porcelain-blue; *Laurens Koster*, a good double blue. Among reds, we remarked *Von Schiller*, a good bright rose; *Macauley*, rosy-salmon; *Cavaignac*, salmon, inclined to flesh; and *Garibaldi*, a bright rosy-crimson. Amongst the Tulips were *Colour Cardinal*, bright scarlet; *Van der Neer*, purple; *Pottebakker*, white; *Keizer Kroon*, golden-yellow, flaked with scarlet; and *Prosperine*, a bright rosy flower.

Stove and Greenhouse Plants.—Mr. J. Ward, gardener to F. J. Wilkins, Esq., of Leyton, had a small but well-grown group, in which were well-flowered plants of *Cytisus racemosus elegans*, a dense-habited variety, with glaucous leaves and spikes of bright yellow flowers; *Eriostemon buxifolium*, a yard high, and 2 feet in diameter, studded with pure white star-like blossoms; a small but wonderfully vigorous plant of *Anthurium Scherzerianum*, bearing four splendid spathes 5 inches in length, and fully 4 inches in width, the colour being bright glowing scarlet; and *Erica M'Nabiana*, about 2 feet in diameter. Mr. G. Wheeler had a smaller group, in which were a good *Erica Lindleyana*; the purple-flowered *Cochlostemma Jacobianum*, with three spikes of purple *Tradescantia*-like flowers; *Imantophyllum miniatum*, bearing half-a-dozen good trusses of showy flowers; *Pancratium fragrans*, furnished with a good truss of bloom; also *Azalea Marie*, a bright rosy-scarlet kind; *Dendrobium nobile*; and the ever-welcome lemon-yellow-flowered *Acacia Drummondii*. Mr. Wheeler had also an effective and well-arranged group of miscellaneous plants. Mr. Ward's *Azaleas* were in excellent condition, and though rather small as exhibition plants, they were well bloomed. The varieties were *A. Borsig*, one of the best semi-double white kinds in cultivation, and very useful for bouquets or wreaths, as its flowers last well after being cut, while the single-flowered varieties fall quickly. The collection also contained *Model*, a kind with clear rosy flowers; *Stella*, a well-known favourite, having large glossy scarlet or crimson-tinted flowers; *Punctata omnicolor*, a striped or variegated variety, in which either red or white predominates; *Roi des Beautés*, a fine semi-double lilac flower, with white edges; and *Madame Van der Cruyssen*, a large rosy-lilac, slightly inclined to be double. Mr. G. Wheeler had a fine little group of *Azaleas*, among which we noted a large crispy-petalled salmon-tinted variety, named *La Paix*, in good condition. The foliage is large and good, and it may be considered one of the best of the salmon-tinted varieties. Mr. J. Child, gardener to Mrs. Torr, Ewell, had six fine plants, among which were the white crisped petalled *A. Marie Vervæne*. The best *Deutzias* came from Mr. J. Douglas, of Loxford, who furnished compact cylinder-shaped ten-year-old plants, about 2 feet high, and very profusely-bloomed, both foliage and flowers being well developed. Mr. G. Wheeler staged a dozen small, but well-bloomed plants of *Clematis*, the plants being trained in a globular form, and profusely studded with large star-shaped purple, blue, or white flowers. Mr. B. S. Williams contributed a well-grown and effective collection of Ferns, Palms, and other fine-foliaged and flowering plants, among which were a narrow-spathed variety of the *Flamingo* plant (*Anthurium Scherzerianum*), very brilliant in colour; *Tillandsia Lindenii*, with elegant grassy recurved foliage, and erect spikes of rich blue Iris-like flowers, having a white eye; a splendid specimen of *Imantophyllum miniatum*, with about a dozen spikes, and a brilliant scarlet white-striped *Amaryllis*, named Mr. Little, with three or four flowers on a scape. Mr. W. Paul, of Waltham Cross, staged a good collection of Camellias in excellent condition, and two stands of beautiful cut blooms; also a stand of his new Chinese *Primula*, named *Waltham White*, a kind which produces stout trusses of large white flowers, of good substance. A well-grown collection of Persian *Cyclamens* came from Mr. James, of Isleworth; and Mr. Little, of Twickenham, had more compact plants of the same, all in the freshest and best condition possible. Messrs. Carter and Co. sent *Coleus Duchess of Edinburgh*; and a crisp-leaved kind, named *Mandarin*; also a bright lilac-purple-flowered variety of the common *Primrose*, named *Lady Adelaide Taylor*, very bright, and well deserving attention. Messrs. Barr & Sugden exhibited a named collection of *Polyanthus Narcissus*. Mr. Charles Turner, of Slough, had a basketful of a new

pale mauve or lilac double Violet, named Lady Hume Campbell, which flowers profusely, the blooms being extra large and deliciously fragrant.

Orchids.—A fine plant of the old *Dendrobium fimbriatum ocellatum* (D. Paxtoni of some gardens) came from Mr. T. Stevens, gardener to Mr. G. Simpson, of Reigate. The plant was fully a yard high, and quite as much in diameter, and bore, at least, fifty drooping spikes of golden-yellow, crimson-eyed or blotched flowers. In Mr. Ward's collection we noted a fine plant of *Cypripedium villosum*, bearing between thirty and forty flowers, and a vigorous plant of *Odontoglossum triumphans*, bearing two spikes, one of which bore five branches and some thirty-six flowers and unopened buds. The smaller spike bore seven finely-formed richly-coloured flowers. This is the best of all the yellow-flowered *Odontoglossa*, and it grows freely in a cool moist temperature. In the same group a well-grown specimen of *Lycaste Skinneri* bore twenty-five flowers and buds, the sepals, petals, and crimson-blotched lip being suffused with bright rose. Mr. G. Wheeler had a fine plant of the old *Epidendrum Stamfordianum* bearing two branched spikes. This plant is remarkable for producing its flower-spikes from the base of the pseudo-bulbs, and not from their apex, as is the case with all others. On one spike were nearly 100 flowers, each about an inch across, the sepals and petals being lance-shaped, of an apple-green tint, and blotched with chocolate; the lip is three-lobed, and of a creamy-yellow tint, the central divisions being elegantly fringed; the apex of the white column and the crest of the lip is of a bright lilac-purple, a colour which gives a bright and delicate aspect to its blossoms. Mr. B. S. Williams staged a small plant of *Cypripedium villosum*, bearing five brown varnished flowers; and a well-bloomed example of the Trumpet-lipped *Dendrobe* (D. lituiflorum), which somewhat resembles D. nobile, but is more slender in habit. The flowers are about 3 inches across, the sepals and petals being white at the base, suffused with bluish-lilac or purple at the tips; the lip is white, shaded with purple, and has a rich purple velvety blotch in the throat. The same collection also included a vigorous plant of *Cymbidium eburneum*, on which there were five flowers; *Aërides Fieldingii*, bearing a small branched spike; and plants of *Trichopilia suavis*, *Lycaste Skinneri*, and the elegant crispy white-flowered yellow-lipped *Dendrobium thrysiflorum*.

Roses.—Mr. W. Paul exhibited three plants of the new Hybrid Perpetual Rose Star of Waltham, which promises to be a favourite. Its colour is rosy-carmine, shaded with purple, the petals being smooth, and of good substance. It obtained a botanical certificate. Mr. H. Bennett, Stapleford, sent a new Tea Rose, named Marie Guillot, a kind having glossy foliage, and creamy-white flowers; and a new Hybrid Perpetual, named Comtesse de Serenyi, in the way of Baroness Rothschild but not so good. Messrs. G. Paul & Son, of Cheshunt, sent a very effective group of Roses in pots, profusely flowered. The blooms on these plants were well-formed, and, as usual, attracted much attention. A new Tea Rose, named Mlle. Marie Finger, was shown in this collection; and Mr. W. Woodley, of Oakwood Lodge, sent a box of cut blooms of *Maréchal Niel*.

Useful Water Barrels.—Where much watering has to be done, a light handy barrel mounted on wheels will be found very useful. One of the best and cheapest appliances of the kind that I have seen of late years was introduced by Messrs. Boulton & Co., of Norwich, some ten or eleven years ago. The barrels had been used for importing and storing paraffin oil, and though by no means heavy were very strong, and were mounted on light iron carriages. We have two of them that have been in regular use in summer for ten years, and are now in good sound condition.—E. HOBDAK.

Plant Labels.—I cannot quite agree with your contributor's article (see p. 253) on this subject. I have long advocated the manufacture of a white delf or porcelain label, with black letters burnt in. Such a label could be made at a small cost, and would, I feel sure, command universal adoption, from its legibility and superiority to anything of the kind extant.—WINCHMORE. [We should ourselves adopt no label which is not capable of being used for other plants besides the one for which it was first written, as the plants in a garden undergo frequent change; and we have always observed that in the case of labels such as those of which our correspondent speaks, there is much waste.]

Generation and Explosion of Gas under a Saddle Boiler.—A nurseryman who is a neighbour of mine, and who has had all his houses heated with hot water by a local firm of ironmongers, is sadly troubled and annoyed by the generation and explosion of gas after his stoker has banked the fire up for the night and shut the furnace and ash-pit doors. These doors open or shut with a lateral motion, and therefore cannot be blown out very easily, but the soot-doors are, on most nights, blown out, and this with such force as to be sent two yards across the stoke-hole. Can anyone suggest a remedy? The stoker has tried various ways of arranging the fire, but, as yet, he has not been able to hit upon the right one.—N. H. P.

OBITUARY.

WE have to record with much regret the death of Mr. Daniel Hanbury, which took place on the 24th ult., at the comparatively early age of 49. As a scientific writer he has been known for upwards of twenty years; but he will be best remembered by the latest of his literary works, the "Pharmacographia," which was the joint production of himself and Professor Flückiger. The value of this work, a review of which appeared a short time back in these columns, is already widely recognised, and will always remain an honourable record of the persevering patience and knowledge of its authors. In horticulture, Mr. Hanbury took much interest. He was better acquainted with medicinal and officinal plants than any other botanist with whose writings we are acquainted, and cultivated many of the rarer kinds.

NOTES AND QUESTIONS—VARIOUS.

The Japan Oak Fruiting.—I have a plant of Japan Oak (*Quercus glabra*) which has at this time a considerable number of very small Acorns on it growing in spikes. I am not sure whether this occurrence is sufficiently rare to be worth mentioning in THE GARDEN, but shall be very glad to learn from any of your correspondents if it is at all uncommon.—K.

Yew Poisoning.—We have had many deaths here from Yew poisoning, but only in the winter, when the sap is down. I have known live Yew to be eaten during summer without any ill effects, while dead Yew is certain death. Laurel will kill during summer and winter, but both in the case of this and Yew dead or decayed leaves are most to be guarded against.—A. MACFARLANE, Great Tew, Enstone.

Telegraph Cucumber.—For six years past I have grown many kinds of Cucumber for winter work, but last season determined to grow none but Telegraph, and right well they have served me. I am no advocate for freezing my Cucumbers at night and broiling them during the day, but keep the temperature at from 65° to 70° at night just now, with an increase of 10° during the day.—R. GILBERT, Burghley.

Lateness of the Season.—According to present appearances, there will be little need of fruit tree protection this year. On Tweedside, few Apricots are in flower, while last year they were in full bloom, and in some places past; of Pears, scarcely one is expanded, and even the common *Ribes sanguineum*—to show the backwardness of blossom—is not in flower, or near it. Horse Chestnuts are still motionless, and their young buds show as yet no symptoms of growth.—CHEVALIER.

Fine Specimens of *Lilium giganteum*.—With reference to "G. K.'s" note in last week's GARDEN on this subject, I may point out that Professor Owen's plants are grown in the open garden throughout the year—a very different thing to growing them in pots. It is not uncommon to see this Lily grown to a large size in pots. It is however, better to grow it in the open air where this can be well done, and the effect of the stately Lily among the round-headed Rhododendrons and other shrubs is very striking.—R.

How to Grow Spinach.—If you want a profitable crop of Spinach, give the leaves plenty of room for full development. A distance of 12 inches from plant to plant is not at all too much, and Winter Spinach should have about 18 inches. The quality of the crop under this treatment will surprise those who grow it thickly. In sowing, use very little seed, and when the crop is well up thin out with a hoe, so as to leave the plants from 6 to 9 inches apart, and then use every alternate plant when large enough, cutting only the largest leaves of the permanent plants when ready.—R. P. B.

Top-dressing Rose Beds.—Beds of Roses on their own roots are often in this season dug over after pruning. The better plan is to surface the bed with almost any kind of soil than to do this. Even a heavy clayey soil, which in one place would be useless, when put on the surface of Rose beds is of great value. In fact, I prefer a mulching of soil to a mulching of dung. After the soil is put on and allowed to lie for a time, it can be raked over, the rough lumps broken, stones picked out, and otherwise left smooth. The shoots may then be pegged down.—CHEVALIER.

Spanish Chestnut.—At page 265 it is stated that the Spanish Chestnut does not ripen its nuts north of the Thames. This is barely correct, for in warm seasons I have eaten the kernels of it in Dumfriesshire and also in Yorkshire; they were not large, however, but apparently ripe enough. The tree grows well here in our thin soil, about the coal measures. In fact, the soil is not above a foot deep, the bottom being a loose kind of rag-stone of a yellowish iron character, among which the roots of the trees penetrate. No other tree grows so fast with us.—J. S. W., Sheffield.

Bitterness in Cucumbers.—In addition to the causes assigned for this by your correspondent "B." (see p. 263) may be mentioned dryness at the root, which, of course, would cause slowness of growth. It doubtless often happens that the bottom of the bed in which Cucumbers are growing in houses (they are seldom bitter on dung-beds) is quite dry, whilst the top is moist or even wet; and in such cases I should expect the fruit to be bitter, even if nothing worse was the result. But bitterness arising from this cause may always be removed in twenty-four hours by thoroughly saturating the rubble, in which the pipes are laid, with water.—E. HOBDAK.

Loose Hay as a Protector.—Mr. Wildsmith advises (p. 269) his readers to shake hay over dwarf bushes and pyramids of hardy fruit, in order to protect them. Does he mean that it should be thrown broadcast over the trees? I can understand twisting hay into ropes, and winding them round, upwards and downwards, and in and out, among the branches; but if he shakes hay loosely over the trees, he must be living in a very sheltered spot, or the cleanliness of his grounds must be a secondary consideration with him. A large farmer once consulted me as to altering the site of his garden, which was close to his stack-yard; and it was always strewn with bits of hay and straw. I pointed out the protective nature of the stack-yard, but order and neatness were to him of more importance than a slight protection.—CHEVALIER.

Hardiness of Sweet Peas.—Your correspondent, Mr. Muir, in his article on Sweet Peas (see p. 255) seems to have ignored the fact, which appears not generally known, that the Sweet Pea is perfectly hardy, and if sown in October, November, and December may be had in bloom a fortnight or three weeks earlier than when sown in April, and, if I mistake not, the early blooms used for bouquets in Covent Garden are obtained in this manner. If sown in February they will bloom earlier than when sown in April. I have some now earthed and staked which were sown in an exposed place in December; the early-sown plants are more vigorous than those put in later, and this applies generally to the annual species of the hardy Leguminosæ. It will hardly, therefore, be an advantage to sow in pots or under glass to gain time.—P.

***Dracæna australis* in the West of England.**—Fourteen or fifteen years ago, I had seed of this plant sent from New Zealand, under the name of the Cabbage Tree of that country, from which I raised a large batch of plants; some of which were planted in the open air, in good well-drained soil. They grew remarkably well, soon formed handsome specimens, and were quite unprotected and uninjured throughout the winter, until the severe weather in 1866, when they were killed to the ground. In the following spring they threw up suckers, and from that time have been quite uninjured. One plant I have just measured, which threw up two suckers, each 11 feet high, has clear stems of 4 feet, the leaves drooping to within 18 inches of the ground. Another is 8 feet high, with a single stem and leaves to the ground: it is not so high, having been transplanted. There are several others of various heights, but all are handsome specimens, and give the place a very tropical appearance. I have raised plants from seed produced in the open air, grown by Mr. Culley, then gardener to W. W. Buller, Esq., Strete Raleigh. The young plants, when first planted out, require protection from rabbits and hares.—JOHN GARLAND, Killaton, Exeter.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

THE BEST METHODS OF TRAINING FRUIT TREES.

It is exceedingly important that training should be thoroughly understood by every one who has to deal with fruit tree culture, or serious disappointment will almost sure to be the result; for the same method of training is not adapted to all kinds of trees nor to all situations, and timely thought on these matters would always be advantageous. When trained on walls, or as espaliers, the horizontal or the fan systems are most generally practised in the case of Apples and Pears on the natural stock; and, as there are few situations in which either the one plan or the other may not be adopted with success, let us first speak of these two systems. There are modifications of the fan, but the ordinary "spread fan" is the simplest, and it embraces all the advantages of the others, of which it is unnecessary to speak. The primary object of the fan shape is to secure an equal distribution of the sap throughout the whole tree, while directing it into as many channels as possible at the outset, in order to cover the wall quickly, and at the same time expend the vigour of the tree in as many outlets as possible—the first step towards fruitfulness. In originating a fan-shaped tree the branches should be started at the point nearest the graft. Nothing like a stem should appear, however short, in the centre, but every branch should diverge from the root, at equal distances apart, with rather an open centre in the tree than otherwise while it is young. The training of a fan is very easy, and consists in simply carrying the points of the main limbs forward as fast as they will grow consistently with well-ripened wood, and in originating auxiliary branches from their upper side, as the radius of the tree extends and the spaces widen between the branches. The fan system should never be adopted on low walls, with trees on the natural stock, as the central branches reach the top of the wall in a few years, and can then only be kept within bounds by a constant system of mutilation, fruitfulness being out of the question. There are some good fan-trained Jargonelles here, with bottom branches 30 feet long; but the wall being only 12 feet high, the middle branches are thick, and make nothing but gross wood annually. Had the trees had room, some of them would have covered 500 yards superficial area, if not more, and by this time such a tree might bear sufficient fruit to fill an ordinary-sized fruit room. It is simply astonishing how much surface a vigorous-growing fruit tree will cover in time, or even in a few years, on the extension system. At Thoresby Park are to be seen wall trees of large size and in excellent bearing condition, that were planted only ten or twelve years ago by the present superintendent, Mr. Henderson. Nothing covers walls of high buildings so fast, nor with such good results, as some of the strong-growing Apples and Pears. If the trees can have a vertical extension of 50 feet or more all the better. At Cannon Hall, in Yorkshire, there are, or were, some fine Pear trees to be seen trained against lofty walls of some of the offices near the gardens, which bore great crops of excellent fruit every year. In such a position a Jargonelle or Marie Louise, for instance, would be at home under a free system of training and extension. For espalier or wall trees of moderate height, the horizontal system of training is undoubtedly the best to adopt in the case of all strong-growing varieties. The simplest method—the training up one straight stem, from which the horizontal branches are all originated about 9 inches apart, and trained at right angles to it, is that here alluded to. By no other system of training can the sap and vigour of the tree be so equally distributed; consequently, while on fan or oblique-trained trees the fruit is often borne in greatest quantity at the extremities of the branches, leaving the heart of the tree unfertile and bare, on the horizontal it is evenly distributed over the whole surface of the tree. This is a well-marked and constant result of the system, and is exhibited to perfection in the little cordon, which is simply a horizontally-trained tree, with one or two limbs instead of fifty. In training young

horizontal trees, it is only necessary to preserve a central shoot, which must be cut back every winter to the bud next to, and above, the two which are to form the horizontal branches the following season, the top bud being the leader, which must be stopped at the height of 18 inches or 2 feet, and the two horizontal shoots allowed to grow as much as they will. Care must be taken also that the latter do not dip, but rather ascend a few inches, at their point of origin. The oblique system of training is generally adopted in the case of weak-growing varieties, the side branches, as the name indicates, being all trained in a slanting, upward direction from the central trunk, instead of at right angles to it, otherwise this mode of training differs in no way from that of the horizontal. The slightly upward direction of the branches is favourable to the flow of the sap. Of the curvilinear, upright, wavy systems, &c., nothing need be said, as they possess no advantages over those described, while they are more fanciful, without being more ornamental, and are often much more difficult to carry out. The fan system of training is undoubtedly the best for stone fruits. Unlike the Apple and Pear, these often make gross shoots in an irregular manner, and, as in the case of the Apricot and Plum particularly, the branches often die off here and there, leaving blanks that could not be filled up successfully by any other system of training than the fan, which permits of a re-arrangement of the branches. Besides, anything approaching the horizontal method renders the branches more liable to die off, and encourages a disposition to make gross shoots, which are the forerunners of "gumming," and often make stone-fruit culture a difficulty in some situations, unless the trees are in experienced hands. Still, though it is pretty well known that horizontal training is altogether inimical to the well-being of stone fruits, it is a method not unfrequently adopted; but a good example of it is seldom met with. On the contrary, one of the worst specimens of Peach-tree training perhaps ever seen was the result of an attempt of this kind. The trees were bare of wood at the bottom, though rampant at the top; and, though strong watery shoots could occasionally be originated lower down from the main trunk, no sooner were they bent down to the horizontal position, than their vigour seemed to be gone; for the following year, if they did not die, they remained stationary, originating a fresh shoot near the base, perhaps, which grew well enough while it was allowed to grow upright, but went the way of the others when bent down in its turn. The trees had to be headed down eventually, and trained on the fan system, than which no other should be recommended. Consequently, stone fruits should never be planted against low walls, unless time can be afforded to pinch and root-prune in a systematic manner, for, when there is room for extension, root-pruning is not often required. Fan and espalier trees are generally planted about 40 feet asunder, and between them are placed "riders" or standards, with 6 feet stems, as extras, to cover the top part of the wall until the dwarfs grow up. Before leaving the subject of wall and espalier training, let us just refer to the more modern plan of furnishing walls with cordons, on the upright or oblique system of training. Undoubtedly this is a first-rate plan of covering low walls with trees on the Quince or Paradise stocks. In some cases a wall 12 feet high may be covered completely in three or four years, by planting the trees 1 foot apart, and taking up one stem from each. Of course a continuous and persistent system of summer-pinchings of the side-shoots is the great desideratum with trees of this description. No systems of training trees in the open ground—round a kitchen garden, for instance—are more conducive to fruitfulness, or more ornamental, than those indicated above. We have had experience of other systems, and notably of the pendulous or balloon plan of training Pears and Apples, but it has not been favourable, if results are to be estimated by the returns given for much labour and pains—in the first instance to make the trees, and afterwards to keep them in shape; for, while they bear no better than bush trees, and not nearly so well as espaliers, generally speaking they want much tying and training and close attention to the rubbing off of the buds at the top of the trees at an early stage, as these persist in pushing with great vigour, to the detriment of the lower branches. Neither can such trees, which eventually assume a rude table shape when the limbs get thick and old, be con-

sidered ornamental in appearance compared with an easy and naturally trained pyramid or well-shaped bush tree growing as Nature intended it. In fact, the "balloon," the "vase," and other rigid forms of training, belong to the age of clipped Hollies and other shrubs, when no tree was considered beautiful that had not been tortured into fanciful shapes according to the taste of the operator. A properly trained bush tree may be made to look symmetrical without being rigid or formal, and by keeping the centre of the tree open, like a Gooseberry bush, and pinching the side shoots of the main limbs once or twice during the summer, as fertile a fruit tree may be created as could be by the most elaborate system of training. Bush trees in some gardens are grown in the form of a round ball, the centre of the tree being filled with wood; this, however, is a wrong practice. They should be trained in the form of a cup, with sloping sides, so as to present as great a surface to the sun and air as possible, and in order that the branches may bear equally on both sides—i.e., inside and outside the cup. A tree of this kind can be formed easily, without the use of a single stake or tie, by simply attending to the practice of always cutting back to an outside bud when shortening the leading shoots. The young tree should at the outset be cut over about 9 inches from the ground. It will push perhaps from four to six shoots the following year. Those which point outwards should be pruned to an out-pointing bud, and the most central shoots removed. The third year the divergence of the branches will be still greater, and the same tactics must be pursued, and so on annually till size and form are secured, which cannot be expected till the branches become somewhat numerous. Apples and Pears of a spreading habit assume the cup form most readily, but the most upright-growing kinds conform easily to systematic pruning, and in the end make the most symmetrical specimens. A somewhat aged Apple tree, scarcely a hundred yards off, which has been operated upon in this way for years, is now almost as perfectly circular in shape, and as evenly balanced as if it had been trained by rod and line, while the limbs are well-furnished with bearing spurs to the ground. Of pyramidal training it need only be said that it is one of the most elegant, easy, and best methods that can be adopted, especially in small gardens, where space is an object.

J. S. W.

RETARDING FRUIT BLOSSOMS ON WALL TREES.

IF the unusual lateness of the season has been trying to spring gardeners, it has been pleasing to fruit growers, for it is a sure fore-runner of a full crop. The greatest difficulty or danger with fruit trees in the spring arises from their precocious excitability. The early bright hot days that awaken the Violets from their winter's sleep in shady places, and quicken the Primroses into beauty on their warm hedge-banks, likewise arouse the dormant buds of our fruit trees into activity, at the risk of almost certain destruction. The buds of all fruit trees are exceptionally late this season, and therefore tolerably safe, and as this is universally admitted, it is somewhat surprising that so little is generally done to retard the blossoming of fruit trees on walls. Various expedients might be adopted for this purpose, the most obvious of which are to shade the trees from early sunshine, to move them off the wall during the winter and spring months, and to change the aspect in the case of some of our more excitable fruits. The question of shade is a somewhat difficult one, and has been brought into disrepute through a reckless and thoughtless use of it; for instance, where canvas rollers are used tolerably close to the wall, they are often let down during bright days, and no doubt shut out the direct light of the sun; but, on the other hand, they allow his heat to pour through them into the small space between the canvas and the wall, whence there is no outlet for the heated air. Without ventilation at the top, such modes of shading are useless, and are even worse than if the blinds had been left up. The increase of temperature and close atmosphere draw out and induce the buds to expand with unusual rapidity, and add to their tenderness and delicacy. If any sort of textile fabric is used for shading, there should be a free space left between its upper edge and the face of the wall. By such a disposition of the shading material, the direct rays of the sun are not only kept off the blossoms, but a current of air is established. Next to opaque screens, woollen netting, &c., perhaps the most useful kind of shading for fruit trees on or off walls are boughs of Spruce, Yew, or branches of Laurel, and other shrubs. If properly arranged they shut out the sun by day, and help to keep off frost at night. They cause innumer-

able eddying currents of air in the immediate vicinity of the blossoms, tending to the modification alike of the heat of the warmest day and the cold of the coldest night. These primitive shades may also be said to be self-adjusting. They gradually become defoliated, and so get thinner, and by the time they are least wanted, they have become mere skeletons, and may be removed, without risk or injury to the blossoms they have sheltered or shaded. Rough straw bands, mounted on poles a foot or two from the walls are also among the most efficient of all available means for the shade and protection of fruit trees. The loose straws, in motion or at rest, cut asunder, as it were, the direct rays of the sun, and likewise tend to impede the energy of radiation. The removal of fruit trees off the walls in winter is a sure mode of retarding their blossoming. Trees thus treated also enjoy a much more uniform temperature than those left upon the walls. In fact, a south wall, while furnishing, upon the whole, the highest temperature available in our climate, also exposes trees to extreme variations. It is the latter, rather than any absolute degree of cold, that creates most damage among fruit trees. The sudden alternations of heat and cold so unsettle the blossoms that they are often ready to drop off, or be destroyed by the merest breath of cold that would not have injured them in the least had it found them in sound condition. Unfastening trained trees annually will be condemned by many as troublesome and impracticable. No doubt it would involve much labour; and where the latter is scarce, as it is in most gardens, the practice may not be possible. Nevertheless it would save many a crop, and would also, in many cases, add to the strength and improve the health of the trees, while the bare walls could be readily cleansed from the larvæ of insects that too often find a congenial and a safe home behind the branches, in old shreds and in ties. But why should Peaches, Nectarines, and Apricots, always have a south or even a west wall? In many parts of England these fruits would perhaps ripen perfectly on a north-west or east aspect. One of the most fruitful Apricots I ever saw was on an east aspect. Perhaps your correspondents will kindly give their experience in this matter, as it is one that needs ventilation. In the eastern counties, for instance, we often find the hotter the aspect the shorter lived are the wall trees. Peaches and Apricots stand longer on west than on south walls; Apricots will ripen on east walls. Has anyone tried them on a north wall, and with what results? I have found the Golden Drop Plum, on an average of seasons, fruit more plentifully on a north-east or north-west than on a south wall. The chief reason seemed to be that the blooms were a fortnight or three weeks later, and consequently a crop became more certain. Singularly enough the fruit least exposed to the sun had at times the most flavour. I have observed the same in regard to Peaches and Apricots. Apricots, on the whole, may be higher flavoured on a west than on a south wall. That the sun may burn the flavour out of fruit is pretty generally acknowledged by practical men. Be that as it may, however, the retarding of the blossom of fruit trees by a change of aspect is one of those questions that might be profitably discussed at the present time, when an unusually late season shows us the importance of the late-blooming of fruit-trees as regards a plentiful fruit harvest.

D. T. FISH.

SHADING PINE-APPLE PLANTS.

I OBSERVE that in your "Calendar" the old-fashioned system of shading Pine plants is recommended, and that too as early as the first week in April. This plan of growing the Pine-apple dates from the last century, when it was considered as an annual-rooted plant which required to be dis-rooted every spring, and started afresh. At that time, nothing was known of the various modern methods of heating, and there was some excuse for the use of shading; but in these days, when Pine-growers have every convenience of this description, and are familiar with the application of artificial heat and the means of regulating the temperature and humidity of the atmosphere of their Pine stoves, one may be forgiven for wondering why a practice, which was once considered obsolete, should again be revived. The advice that the roof-sashes of Pine stoves should be painted with milk and lime will be considered by a large number of Pine-growers as wholly unsound. It will appear to them quite as unnecessary to shade Pine plants as it is to shade early Vineries, Peach, Fig, Cherry, Plum, or other fruit houses. In such a climate as that of England, it is no wonder, when such a practice obtains, that there are so many badly swelled and imperfectly coloured fruit, and that so many complaints of "black-hearted" Pine-apples, and watery insipid Melons, &c., should be made. No wonder either that your contributor should some time back have condemned that splendid variety, the Queen, on account of its taking such a long time to furnish a fruiting plant. He spoke of two, three, or even four years being required to accomplish this; for my own part, I never knew any kind of Pine-apple that

gets sooner into a fruiting condition than the Queen, a variety of which I have fruited many thousands, from eight to fifteen or sixteen months old, and the fruits thus obtained were perfect, both in point of size and beauty. An experience in Pine growing which extends over fifty years, enables me to assert that Pines produced by old plants never were, and never can be, as fine and perfect as those cut from sturdy, robust plants of a few months' growth, pushed on without check and without that period of rest that is so strongly, but I think so unadvisedly, recommended by some Pine growers. My system is to grow them on continuously until they have fruited; and, although it may be true that a Pine plant may, by shading, and by the administration of poor, insufficient nourishment, be kept growing on, without showing fruit, the latter, when it does appear, will invariably be of a comparatively inferior quality. The complaint of your contributor, that his Queens took a long time to fruit, may be a perfectly true and just one, but the circumstance requires no further explanation than the candid admission which he makes respecting the treatment to which they were subjected. J. BARNES.

Fruit Prospects in Yorkshire.—Fruit prospects generally are good. Apples, Pears, and Plums are well set with fruit buds. Many Apricots are grown in the north of Yorkshire, and the trees are now loaded with bloom. Peaches and Nectarines are promising, but are not grown in large quantities hereabouts, on account of the uncertainty of the crop ripening in unfavourable seasons. The Gooseberry crop is not very promising, on account of the great destruction of buds committed by birds during the late severe winter. Long shoots of last year's growth, 18 inches long, may be seen with every bud stripped off, except two or three at the end of each shoot. They are now coming into bloom, and appear to be a fortnight later than usual. Raspberry canes, owing to the dry summer last year, are small. Should there be no severe May frosts, we may look forward, in the north of Yorkshire at least, to an abundant fruit crop. This account applies also to the great fruit-growing district of Thirsk.—H. T., *Fencote*.

American Cranberries.—I happened to receive from my valued friend Mr. Gloede, the celebrated Strawberry grower, several numbers of THE GARDEN, and in one of them (p. 232) a correspondent, Mr. E. W. Cooke, asks for hints as to the culture of the American Cranberry. About this part of the subject I know nothing, but I can inform him, I believe, as to the right time to gather the fruit. In the moors and marshes of the Russian province of Kiew the European Cranberry (*Vaccinium*) is very much grown, and the berries are brought to market in large quantities, but not until they have been subjected to a hard frost; for, without this, the jam which is made from them never has the agreeable flavour that makes it such a favourite in some countries. So far as harvesting the fruit goes, there most likely is no difference between the European and the American variety. The jam made from the fruit of the former has an unusually delicate flavour.—EDMUND NIBELSIECK, *Villa Albertina, Hamburg*.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Apricot Branches Dying Off (see p. 278).—By raising seedling Apricots, and planting them instead of worked plants, your correspondent will find branches dying off to greatly diminish. This hint I got some years ago from Mr. Powell, of the Royal Gardens, Frogmore, whose skill in all matters relating to fruit culture is well known.—R. GILBERT, *Burghley*.

Grapes well Kept in Bottles of Water.—As I find considerable prejudice is still entertained against the cutting of Grapes, when thoroughly ripe, and preserving them in bottles of water, I send for your inspection a bunch of Lady Downes, cut six months from the Vine, and preserved in bottles of water, as was described by me in THE GARDEN (see Vol. I., p. 348). The Grape-room here is also used for storing our finest varieties of Pears and Apples for dessert.—RICHARD NISBET, *Aswarby Park Gardens*.—[The berries looked as if they had just been gathered from the Vine, and were perfect in flavour.]

Fruit Prospects in Northamptonshire.—Apricots with me on 700 feet of south walling promise to be a good crop; for the last fortnight the blossoms have been most attractive, and just now (April 4th) they are to all appearance setting well. Peaches and Nectarines on south walls are one sheet of bloom. Cherries and Plums on both east and west walls are thickly set with fruit buds, which are swelling rapidly. Pears are also full of fruit buds, more particularly Passe Colmar and Fondante d'Antoine. Apples I have never seen more promising. Fruit trees this season have been at least three weeks later in coming into bloom than usual.—R. GILBERT, *Burghley*.

Loose Hay as a Protector.—In answer to "Chevalier" (p. 292), allow me to say that, unfortunately for my own comfort, I am so constituted as to consider no labour too great if by it my end can be gained, and having more than once saved my Gooseberries from destruction by frost by shaking loose hay over the bushes, I have considered the accomplishment of this worthy of the time requisite to put the place in proper trim again. I did not for a moment think that anyone would take it for granted that I recommended loose hay as a permanent covering; on the contrary, it is only to be adapted on an emergency. Generally the keenest frosts occur on the calmest nights, when but little litter need be feared from the hay, and if there should be, what then? Is not a crop of fruit of more value than a few days untidiness? Let me have the fruit first and the neatness afterwards.—W. WILDSMITH, *Heckfield*.

THE INDOOR GARDEN.

PITCHER PLANTS AT DRUMLANRIG.

WHEN I wrote (see p. 233), asking for a little further information respecting these, I did not for a moment doubt the accuracy of the description given; but I was under the impression that there had been a mistake as to the variety named that had produced the large pitchers in question. It appears, however, that such is not the case. I can assure "F. W. B." that, in objecting to baskets for growing Pitcher plants in, I was perfectly aware of what I was about, having given them a fair trial. No matter how much Sphagnum you clothe the basket with, the roots will protrude through it—and perish, too, unless the atmosphere of the house is kept like a vapour-bath, and too moist for most other plants. The nurserymen who grow *Nepenthes* in baskets simply do so because they have a neater appearance than when in pots, and consequently sell better. When Pitcher plants are produced in baskets half as fine as those which have been repeatedly seen in pots, I shall feel better satisfied with basket culture. Pitcher plants being amongst the most singular of vegetable forms, I should like to see them everywhere where means exist for their culture. They will succeed perfectly in an ordinary stove, where the night temperature in winter is not allowed to fall below 60° or 65°. They like to be hung up close to the glass, and moderately, but not too heavily, shaded from the sun, from the middle of March to the end of September. They cannot endure their roots in soil of a close adhesive character, or at all sour or retentive of stagnant moisture. The quantity of water which they must have, especially while growing, makes it necessary to be particularly careful to guard against such conditions; therefore, nothing but fibre from the best peat, with nearly all the earthy matter removed from it, should be used. This, cut or pulled into pieces about the size of pigeons' eggs, with about an equal quantity of chopped clean Sphagnum, and one-fifth of charcoal or broken crocks, are what I have always used. I fill the pots one-fourth with drainage, over which I place a little Sphagnum. In re-potting, I do not even move the crocks from the bottom, if the roots are matted amongst them, for they are the most brittle, as well as impatient of injury, of any roots with which I am acquainted; so fragile are they, indeed, that I have known persons, in potting these plants, pull the roots off, under the impression that they are dead. They dislike over-potting; a 6-inch pot is large enough for a plant of *N. Rafflesiana*, with a single shoot until it gets 3 feet high, when it may be shifted into one a couple of inches larger. The soil must never, even when the plants are at rest, be allowed in the smallest degree to approach a dry condition; water thoroughly twice or three times a week in winter, and every day when they are growing. Syringe overhead every day, as they are liable to thrips, which, if allowed to remain on them, will destroy the Pitchers long before they arrive at perfection. By following diligently these details, anyone may grow Pitcher plants. In conclusion, I would say, especially to those who have not had experience in their cultivation, grow them in pots; and, if there is any objection to the appearance of the latter, plunge them in baskets lined with living Sphagnum. T. BAINES.

Top-dressing Azaleas and Camellias.—Mr. Muir's further explanation of his views on this subject (see p. 276) only makes the practice which he advocates appear more palpably bad. Injurious as it is to a plant to destroy its roots in moving the existing surface-soil to make way for new material, it is infinitely worse to lay the new soil on without removing any to make room for it. More of the least easily managed hard-wooded plants are killed in potting through not keeping the collar of the plant and the thick roots at their junction with it sufficiently elevated and in a measure above the soil than through any other cause. If ever we see a hard-wooded plant continue in health and vigour to an age beyond the generality of its species, it is sure to be one that has the collar and principal roots, where they proceed from it, almost above the surface; for to cover these with fresh soil would simply be to ensure destruction. All seeds of trees and shrubs are naturally self-sown on the surface; having vegetated, the young plants are invariably found with the collar and some portion of the roots more or less above ground. Deep planting, or, what is the same thing, adding soil to the surface at any time after planting are alike injurious in their effects. Some plants are enabled through the strength and vigour of their constitution to bear up under unnatural treatment, but delicate-rooted hard-wooded subjects usually die. Let us, therefore, endeavour, if possible to obviate such a result.—T. B.

Begonia erecta multiflora.—This makes a pretty and useful decorative plant, having metallic-coloured leaves and pale pink flowers, which are produced in great profusion at every leaflet. In large 60-sized pots placed along the curbs of the plant-stove, it contrasts well with other plants, either in or out of bloom, and ought to find a place in every collection.—R. GREENFIELD.

NOTES OF THE WEEK.

— TWELVE years ago few gardens contained any Lilies at all, beyond perhaps a few of the Japan kinds in pots, all the other hardy kinds having been discarded; since then they have, fortunately for our gardens, become remarkably popular. The number of fine species is multiplying so rapidly in our gardens, and so many desire to have them correctly named, that we have thought it well to translate Mr. Baker's exhaustive account of the species (originally published in Latin in the "Linnean Society's Journal"). For various reasons it has been considered best to publish the description of all the species in one number, and we have attempted to illustrate, as well as possible under the circumstances, all the kinds of which figures are obtainable. It may be as well to add that Mr. Baker is not responsible for the selection of these illustrations, or for the appearance of the article in its present form. Upwards of twenty of the best illustrations are from the pencil of Mr. Burbidge, engraved by Mr. Hyde.

— In the Edinburgh Botanic Garden, Mr. M'Nab states that, in spite of the severity of the winter, comparatively little injury has been done to vegetation. He adds that the small number of plants in flower on the 1st of January is in marked contrast to that of the same day last year. In 1875, the only blossoms obtainable were *Jasminum nudiflorum*, four species of *Helleborus* or Christmas Rose, and *Gentiana acaulis*; whilst, in 1874, no fewer than 138 species and varieties were collected in flower. Dr. Moore writes to us from Glasgow, and says that it is the latest spring they have experienced at Dublin for many years.

— WE have received a canister of Oyster Bay Asparagus which is said to be better than French preserved Asparagus. Oyster Bay township on Long Island is the place where it was grown and preserved. It is a specimen of very good Asparagus cut at its best, and therefore delicate in texture, and of a good green colour. We confess, however, that like all preserved Asparagus, it tastes somewhat of the can. This, however, may be an insurmountable difficulty in the preservation of Asparagus, for nothing could be more carefully preserved than this appeared to be.

— WE are requested to state that the Pelargonium trial at Chiswick will be carried out as usual; and that the officers of the Royal Horticultural Society, desirous of keeping up to the utmost the status of the Chiswick Garden in the present precarious state of the Society's affairs, will this season make a special effort in this direction. They, therefore, trust that the raisers of seedlings, as well as the introducers of foreign novelties, will, as usual, send for this purpose plants of such new varieties as they may be able to spare; and if they will, at the same time, specify whether or not they would desire any of them to be grown in pots, Mr. Barron, the superintendent, will be ready to give effect to their wishes. The superintendent is prepared to receive and take charge of the plants at once, and requests that those who intend to send will do so as early as possible, addressed to him, at the Royal Horticultural Gardens, Chiswick.

— A CONFERENCE consisting of delegates from the Agricultural, Botanic, Royal Dublin, Horticultural, and Meteorological Societies, has, at the request of the last-mentioned, drawn up some "Instructions" for the observation of the appearance of certain plants, insects, and birds. In the preparation of these instructions the conference was greatly assisted by the Rev. T. A. Preston, of Marlborough College, who has worked for many years laboriously at such records. A list of seventy-one of the most widely-distributed and commonest plants is given, and those who cannot undertake to observe so many are requested to pay attention to fourteen of them printed in capitals. This is followed by some necessary instructions, and a table of average dates for ten years, as observed at Marlborough, of the appearance of the various species. So far as appears, it is only the observation of the date of first flowering that is required. Forms for such records may be obtained at the Meteorological Society's offices, 30, Great George Street, Westminster.

— SOME time since a suggestion was made that the Pelargonium Society should hold its show in the great conservatory at Chiswick, instead of at South Kensington, and the proposal seemed so apposite, that many of the members felt inclined to adopt it. On more mature consideration, however, it was found that the competition for Messrs. Veitch's fruit prizes was fixed for the same day. As these two items, fruit and Pelargoniums, made up last year one of the best South Kensington shows of the season, and as Messrs. Veitch objected to the competition for their prizes taking place at Chiswick, the committee felt that any change of the original arrangements would do an injury to the Royal Horticultural Society, without yielding any corresponding benefit to the Pelargonium Society. The show will, therefore, be held this year at South Kensington, as announced in the circulars already issued. The Committee hope, moreover, to be able to make

arrangements to hold the Pelargonium show next year at Chiswick, at a date which, as nearly as possible, may coincide with the height of the blooming season of the bedding varieties, which could scarcely have been the case this year, the date being fixed for July 21.

— THERE is no chance of the contemplated exhibitions of Amsterdam and Brussels interfering with each other. At a meeting of delegates held at Antwerp during the exhibition just closed, it was decided that Brussels will celebrate its centenary next year, and that Amsterdam will hold its great exhibition in 1877.

— BIRDS often destroy the blooms of Crocuses, a fact which may be observed in the case of those in the flower-beds in Hyde Park. It is remarkable, however, that while the yellow flowers are extensively destroyed, the white ones remain uninjured.

— LAST season, General Bidwell, on his estate of 22,000 acres, planted 110,000 Grape Vines of the White Muscat of Alexandria, the great raisin Grape of California. He commenced making raisins of this Grape last autumn, and those he has on hand now are, according to the "Californian Horticulturist," certainly as fine as any Malaga raisins can be.

— A DISEASE, similar to dry rot, is stated to have attacked the Lemon plant. It seizes sometimes the roots, sometimes the branches, whence it gradually spreads through the whole tree, drying up its sap in its course. Attempts have been made to check its ravages, but hitherto without success. It is said that similar appearances have been noticed in Orange plantations.

— WE have recently purchased some preserved Lima Beans in London, and find they retain to a great degree their good and peculiar flavour. This excellent Bean is too tender for open-air cultivation in this country, but it would probably repay those who gave it a chance in a forcing house. It is very popular in warmer countries than ours.

— AN official decree has been published in France, prohibiting the importation into, and the transit through, that country of Potatoes from the United States or Canada. Dead leaves, as well as sacks and barrels, or other articles which have been used for the packing of Potatoes, are included in this prohibition.

— THE well-known Manley Hall estate, near Manchester, including the mansion, the conservatories, Ferneries, and shrubs, and 80 acres of freehold land on which they stand, has been sold by Mr. Sam Mendel to Mr. Ellis Lever, of Spring Bank, Bowdon, who is well-known in Manchester as the principal of the Midland Coal Company. The estate realised, we understand, nearly £150,000.

— THE Enclosure Commissioners have made their annual report of proceedings under the Metropolitan Commons Act of 1866. Since the passing of the Act there have been five schemes certified by the Commissioners and confirmed by Parliament, viz., for Hayes Common, Kent, about 200 acres in extent; Blackheath, 267 acres; Shepherd's Bush Common, 8 acres; Hackney Common, 166 acres; and Tooting Beck Common, 144 acres.

— AMONG beautiful hardy flowers now in bloom in London gardens are the rich blue *Scilla sibirica*, five or six species of Daffodils, the delicate porcelain blue-tinted *Puschkinia scilloides*, and several rosy and white-flowered ornamental-leaved Dog's-tooth Violets. Gold-laced Polyanthuses, and white, purple, lilac, and crimson Primroses are likewise now very attractive, as is also the lovely blue Forget-me-not (*Myosotis dissitiflora*) in sunny corners. Moreover, the rich purple gold-spotted bulbous *Iris reticula* is very effective, as is also the crimson-purple *Sisyrinchium grandiflorum*, a plant possessed of fairy-like grace, and perfectly hardy.

— THERE are some happy spots not visited by such easterly breezes as in Europe and America have of late withered buds and men alike. The "Californian Horticulturist" of March says, the rapid development of the season is now seen in all warm and sheltered districts in this region. In Solano, Suisun, Napa, and Sonoma, since the rains, the grains and Grasses have grown as rapidly as "Jonah's Gourd," and in these regions the Almond and Plum trees are bursting into bloom. Most fortunate has it been for our fruit crop, that we have had cold weather and no rains till recently. Thus far everything bids fair for an immense crop of fruit of all kinds. The supply of Green Peas was never known to be so large as it was about the end of February. A few were generally to be found in market all winter, but they were never before sufficiently abundant in February to sell for 3d. or 4d. per pound. Within two or three years a considerable tract of land along the foot-hills in the vicinity of Warm Springs, Alameda County, has been found peculiarly adapted to the growth of early Peas, in consequence of its almost entire exemption from frost, and this region now furnishes almost the whole supply. The daily receipts average nearly 100 sacks, or about 4 tons. Asparagus came forward at the same time in limited quantities, but the abundance of Peas interfered materially with its sale, and kept articles below the fancy figures usually obtainable at this season.

THE FLOWER GARDEN.

ALL THE LILIES.

Generic Characters.

PLANTS of the temperate zone of both the New and the Old World, with scaly bulbs, numerous leaves, either scattered or in whorls, and with handsome summer-blooming flowers produced in racemes or solitary. Perianth, corolla-like, deciduous, in six divisions, funnel-shaped, with equal ob-lanceolate segments, which are more or less falcate in the expanded flower, smooth, or on the upper surface marked with flat prominences, white, or of a splendid yellow or red colour, never tessellated, the claws furnished with a distinct nectariferous groove, which, however, is sometimes wanting; stamens, six in number, equal in length, faintly perigynous, included; filaments, elongated, thread-like, or slightly flattened, more or less curved; anthers, versatile, attached on the inside by the middle of the back, dehiscing outwardly along the entire margins; ovary, sessile, cylindrical, three-celled; ovules, numerous, horizontally arranged in each cell; style, club-shaped, more or less curved, most frequently longer than the ovary; stigma, rounded, three-lobed; capsule, coriaceous, obovoid, six-angled, with a three-valved loculicidal dehiscence; seeds numerous, discoid, margined, and with a brown membranous skin.

Sub-genus I. Cardiocrinum.—Perianth, funnel-shaped, with oblanceolate segments, falcate only at the apex.

Leaves, stalked, heart-shaped, ovate.—1, cordifolium; 2, giganteum.

Sub-genus II. Eulirion.—Perianth, funnel-shaped, with oblanceolate segments, which are falcate only at the apex; leaves, linear or lanceolate, sessile, or nearly so.

Tube scarcely widened from the base to the middle.—3, philippense; 4, Wallichianum; 5, longiflorum; 6, neilgherrense.

Tube gradually narrowing from the base to the neck; leaves, scattered.—7, japonicum; 8, Krameri; 9, nepalense; 10, candidum; 11, Belladonna.

Leaves in whorls.—12, Washingtonianum.

Sub-genus III. Archelirion.—Perianth, open, funnel-shaped, with deeply-spreading segments, which are broadest below the middle; stamens, diverging from the curved style.

Leaves, sessile.—13, tigrinum; 14, oxypetalum.

Leaves, shortly-stalked.—15, speciosum; 16, auratum.

Sub-genus IV. Isolirion.—Perianth, erect, with segments, which are falcate in the expanded flower, but not revolute; stamens diverging on all sides from the straight style.

Leaves in whorls.—17, philadelphicum; 18, medeoloides.

Leaves, scattered; style longer than the ovary.—20, bulbiferum; 21, croceum; 22, davuricum; 23, elegans; 24, Catesbæi.

Sub-genus V. Martagon.—Perianth, cernuous, with the segments very revolute; stamens diverging on all sides from the curved style.

Leaves in whorls; American species; bulbs, annual, bearing rhizomes.—25, canadense; 26, pardalinum; 27, superbum; 28, Rœzlei; 29, columbianum; 30, Humboldtii.

Old-world species.—31, Martagon; 32, avenaceum; 33, Hansoni.

Leaves, scattered—leaves, lanceolate—many-nerved; perianth, falcate above the middle.—34, monadelphum.

Perianth, revolute to below the middle.—35, polyphyllum; 36, ponticum; 37, carniolicum.

Leaves, narrowly linear, with one or few nerves; segments of the perianth, from six to twelve lines broad in the middle.—38, testaceum; 39, Leichtlinii; 40, pseudo-tigrinum.

Segments of the perianth, from three to six lines broad in the middle.—41, pomponium; 42, chalcedonicum; 43, callosum; 44, tenuifolium.

§ **Cardiocrinum** (Endl.).—Perianth, funnel-shaped, with oblanceolate long-clawed segments, which, in the expanded flower, are falcate only at the apex, and are not papillose on the inner surface, and have a shallow groove on the keel; stamens, slightly curved, and parallel with the style; leaves, heart-shaped-ovate, with a reticulated venation and long stalks. It is distinguished from the other sub-genera by its Smilax-like leaves.

1. L. cordifolium.—Thunb. Linn. Trans. ii., 332; Schult. fil. Syst., vii., 420; Sieb. et Zucc. Flor. Jap. fasc., iii., 33, t. 13, fig. 2 and 14; Kunth, Enum., iv., 268; Miquel Ann. Mus. Lug. Bat., iii., 157; Saussurea cordifolia, Salisb. Linn. Trans., viii., 11; Hemerocallis cordata, Thunb. Fl. Jap., 143; Gaertn. Fruct., ii., 484, t. 179, fig. 5.—The bulb of this plant is, in every respect, like that of *L. giganteum*, but smaller, and with thicker, more wrinkled, and less regular scales; stem, 3 to 4 feet high, naked at the bottom, and with the leaves at first arranged in rosettes, the lowest ones stained with blood-red, the stem-leaves ovate, deeply heart-shaped, and with long stalks;

the raceme, in the specimens which I have seen, is not quite a foot long, contains from four to ten flowers, and, when fully expanded, is from 9 to 14 inches across, the foot-stalks of the flowers being



Heart-shaped leaved Lily (*L. cordifolium*).

2. L. giganteum.—Wallich, Tent. Fl. Nep. 21, t. 12-13 (excl. syn.); Kunth, Enum. iv., 268; Hook. Bot. Mag. t. 4,673; Flore des Serres, t. 771-2; Belg. Hort. iii., t. 21.—*L. cordifolium*, D. Don, Prod. Nep. 52, non Thunb.—Bulb, globose, caespitose, perennial, 3 to 4 inches thick; scales, ovate, somewhat spreading; stem, 6 to 10 feet, high, terete, smooth, green, 1½ to 2 inches thick at the base; radical leaves, green, not tinged with red; stem-leaves, twelve to twenty in number, extending to the base of the stem, scattered, ovate-acute, deeply cordate at the base, of a deep green colour, reticulated-veined, the lower ones 12 to 18 inches in length and breadth; leaf-stalks, erect-patent, channelled, 9 to 12 inches long, the upper ones gradually smaller, and on shorter foot-stalks; raceme, of ten to twelve flowers, and from 1 to 2 feet in length, attaining a foot in width when fully expanded; bracts, boat-shaped, large, ovate, caducous; pedicels, 3 to 12 lines long, at first almost nodding,



Giant Lily (*L. giganteum*).

but ascending when bearing fruit; perianth, funnel-shaped, fragrant, 5 to 6 inches long, white, tinged with purple on the inside, and with green on the outside; tube, gradually widened from the base (where it is 6 or 7 lines in diameter) to the neck (where it is from 18 to 21 lines in diameter); segments, ob-lanceolate, 9 to 12 lines broad at the base of the upper quarter of their length, gradually narrowed towards the base, inner ones broader; stamens, two-thirds the length of the perianth; filaments, flattened downwards, nearly straight, 3 to 3½ inches long; anthers, yellow, 3 to 4 lines long; pollen, yellow; ovary, cylindrical, 1 inch long; style, scarcely curved, one and a half, or nearly twice the length of the ovary; capsule, broadly oblong, 2 or 3 inches long, obtuse-angled, umbilicated at the apex; neck, large, top-shaped. Temperate region of the whole Himalayan chain, from Kumaon and Gurwhal to Khasia and Sikkim, at an altitude of from 5,000 to 10,000 feet. "It flowers in the rainy season, from May to the end of July," Wallich.

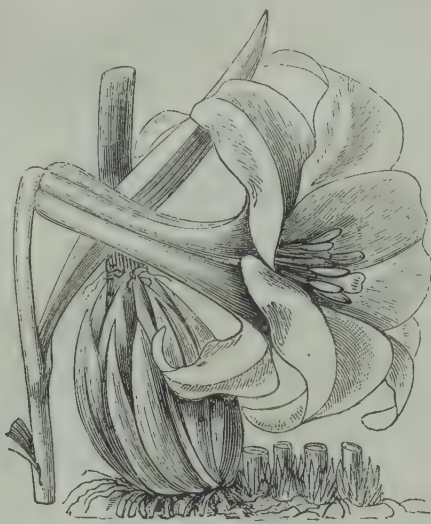
§ **Eulirion** (Endl.).—Perianth, funnel-shaped, with long-clawed oblanceolate segments, which are falcate only at the apex, not papillose on the inside, seldom dotted; groove on the keel shallow; stamens, slightly curved, parallel with the style; leaves, linear or lance-shaped, sessile, or nearly so; flowers, fragrant, often white, never brilliant red nor yellow.

3. L. philippense.—Hort. Veitch; Baker, Gard. Chron., 1873, with a plate.—Bulb, ovoid, perennial; stem, 1½ to 2 feet high, one-headed, slender, terete, smooth, green, or spotted with purple; leaves, thirty to forty in number, scattered, patent-falcate, narrowly linear, 3 or 4 inches long, 1½ to 2 inches broad, smooth, three-nerved,

and of a shining green colour; perianth, horizontal, white, slightly tinged with green on the outside near the base, narrowly funnel-shaped, 7 or 8 inches long; tube, $\frac{1}{2}$ inch in diameter near the middle;



Philippine Island Lily (*L. philippense*).



Wallich's Lily (*L. Wallichianum*).

segments, oblanceolate, falcate only at the apex, long-clawed, 15 to 18 lines broad at three-quarters their length from the base, smooth and undotted on the inside; keel, indistinct, green; stamens, a little shorter than the perianth; filaments, greenish, slightly curved, 5 to 5 $\frac{1}{2}$ inches long; anthers, 2 $\frac{1}{2}$ to 3 lines long; pollen, yellow; style, together with the ovary, $\frac{1}{2}$ an inch shorter than the perianth; Philippine Islands; Wallis in hort. Veitch.

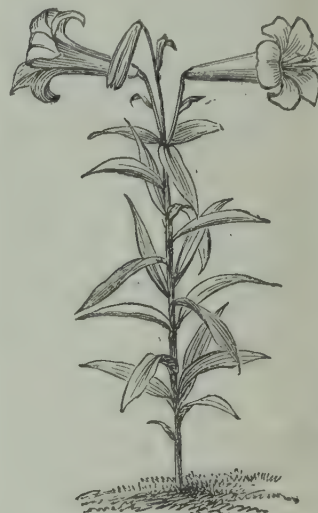
4. *L. Wallichianum*.—Schultes fl. Syst. vii., 1689; Kunth, Enum. iv., 267; Wall. Cat. 5,076; Hook., Bot. Mag. t. 4,561; Lindl. et Paxt. Flow. Gard. 1850, 120, with a plate; Lemaire, Jard. Fleur, t. 105, 106; Flore des Serres, t. 612.—*L. Batisua*, Hamilt. M.SS.—*L. japonicum*, D. Don, Prod. Nep. 52, non Thunb.—*L. longiflorum*, Wallich, Tent. Fl. Nep. 40, t. 20, non Thunb.—Bulb, ovoid, 2 to 3 inches long; scales, thick, white, acute, closely imbricated; stem, 4 to 6 feet high, green, straight, terete, horizontal at the base; leaves, fifty to sixty in number, somewhat distant from each other, scattered, ascending, sessile, acuminate, smooth, green, the lower ones 6 to 9 inches long, 3 to 6 lines broad in the middle, three-nerved, the upper ones shorter and broader, often five-nerved; flowers, often solitary, sometimes two or three in number, fragrant, horizontal from the top of the pedicel or slightly ascending; perianth, white, greenish on the outside at the base, 5 or 6 lines in diameter, at 3 inches above the base; 7 to 9 inches long; tube, 3 or 4 lines in diameter at the base; segments, with oblanceolate claws, acute, 1 $\frac{1}{2}$ to 2 inches broad at three-fourths their length from the base; stamens, 2 inches shorter than the perianth; anthers, yellow, 12 to 14 lines long; ovary $\frac{1}{2}$ inch to 2 inches long; style, together with the ovary, as long as the stamens. The sub-temperate region of the Central Himalayas (Kumaon, Nepal, &c.), at an altitude of from 3,000 to 4,000 feet. In Max Leichtlin's garden there is a smaller and more slender form, with about twenty-five leaves, which are distant from each other, the lower ones smaller than the upper ones; anthers, 6 lines long; and another form, which has numerous leaves (200) much more closely set, and a stem 5 feet high.



White Japanese Lily (*L. longiflorum*).

5. *L. longiflorum*.—Thunb. Linn. Trans. ii., 333; Bot. Reg., t. 560; Lodd. Bot. Cab., t. 985; Bury, Hexand., t. 8; Kunth, Enum. iv., 266; Flore des Serres, t. 270; Miquel, Ann. Mus. Lug. Bat. iii., 157.—Bulb, perennial, globose, yellowish, with lance-shaped scales; stem, 1 to 3 feet high, straight, smooth, green, 3 or 4 lines in

diameter; leaves, twenty to forty in number, scattered, ascending, tolerably closely set, of a shining green colour, five-nerved, those at the middle of the stem 3 to 4 inches long, and 4 to 6 lines broad in the middle, the upper ones more distant from each other, shorter, and lance-shaped; flowers, usually solitary (sometimes two to six in number), nearly horizontal; perianth, white, fragrant, narrowly funnel-shaped, 5 to 7 inches long; tube, 2 or 3 inches long, scarcely widened above the base; segments, oblanceolate, obtuse in the expanded flower, falcate in the upper fourth of their length, 12 to 18 lines broad at two-thirds of their length from the base; inner ones



Dwarf White Japan Lily (*L. eximium*).

broader; filaments, white, 4 or 5 inches long; anthers, yellow, narrow, 6 to 9 lines long; pollen, yellow; ovary, 1 to 1 $\frac{1}{2}$ inches long, and, along with the slightly curved style, scarcely exceeding the stamens in length; stigma, 4 to 4 $\frac{1}{2}$ lines in diameter; capsule, narrowly oblong, obtuse-angled, umbilicated at the apex. Temperate regions of Japan, Oldham, 734, Maximowicz, &c.; China, Fortune, 57, 66, Reeves; Hong Kong, Capt. Urquhart; Formosa, Wilford, 548; Swinhoe; Oldham, 565; Capt. Champion; Loo-choo Islands, Capt. Beechey, C. Wright. For the various forms of this plant, see Duchartre, Obs. pp. 37-40. The finest variety of all is *L. eximium*, Court. Spae Mon. 14; Flore des Serres, t. 283-4.—*L. Jama-juri*, Siebold et De Vriese, Tuinbow Flora i., 319, t. 11.—*L. eximium Wilsonii*, Hort. Angl., is of taller growth, and has broader leaves and larger flowers, 8 or 9 inches long.

—*L. Takesima* and *abchasicum*, Hort., are forms of *longiflorum*.

6. *L. neilgherrense*.—Wight, Ic., t. 2,031-2.—*L. tubiflorum* Wight, Ic., t. 2,033-4.—*L. Wallichianum*, Wight, Ic., t. 2,035, non Schultes, fl.—*L. Metzii*, Steud. in Hohen. Ind. Or. Exsic., No. 954.—*L. neilgherrense*, Hort. Veitch. Lemaire; Ill. Hort., x. t. 353.—Bulb, globose, 2 or 3 inches long; scales, thick, lance-shaped; stem, 2 or 3 feet high, straight, smooth, decumbent for some length at the base; leaves, thirty to forty in number, of a shining green colour, ascending, firm, closely set, scattered (*i.e.*, not in whorls), distinctly three-nerved, the lower ones 3 or 4 inches long, and 12 or 13 lines broad in the middle; flowers, one to three in number, ascending, white, fragrant; perianth, narrowly funnel-shaped, 6 or 7 inches long; tube, 2 or



The Tube-flowered Lily (*L. neilgherrense*).

3 inches long, scarcely widened above the base; segments, oblanceolate-clawed, in the expanded flower falcate only at the apex, cuspidate, callous at the apex, downy, 15 to 18 lines broad at three-quarters of their length from the base; stamens, a little shorter than the perianth; anthers, narrow, yellow, 9 to 12 lines long; pollen, yellow; ovary, 12 to 14 lines long, and, along with the slender style (which is from 3 to 3 $\frac{1}{2}$ inches long), equal in length to the stamens; capsule, oblong, obtuse-angled. Temperate region of the Pulnies and Neilgherry Mountains, in the Indian Peninsula; Wight, Gardner, &c.—*L. tubiflorum* and *Wallichianum* (Wight), are forms with smaller and nar-

rower leaves (6 to 9 lines broad in the middle), and with narrower perianth-segments (12 to 15 lines broad).

7. *L. japonicum*.—Thunb. Fl. Japan, 133; Mém. Acad. Péters. iii., 205, t. v. fig. 2; Bot. Mag., t. 1,591; Lodd. Bot. Cab., t. 438; Reich. Exot., t. 88; Kunth, Enum. iv., 257; Miquel, Ann. Mus. Lug. Bat. iii., 157.—*L. odorum*, Planch., Fl. des Serres, t. 876-7.—Bulb, globose, perennial; stem, 1 to 2 feet high, straight, smooth, spotted with purple; leaves, twelve to twenty in number, scattered, ascending, dark green, more slender than those of *L. longiflorum*, smooth, lance-shaped, acute, five to seven-nerved, 8 to 12 lines broad in the middle, the lower ones 4 to 6 inches long; flowers, sweet-scented, usually solitary, white on the inside, and more or less tinged with purple on the outside; perianth, 5 or 6 inches long, broadly funnel-shaped, gradually widened from the base to the neck, where

it is from 15 to 18 lines in diameter; segments, oblanceolate-clawed, obtuse, in the expanded flower, falcate in the upper third part of their length, 15 to 18 lines broad at two-thirds of their length from the base; filaments, whitish-green, shorter than the perianth by one-third; anthers, thick, oblong, 5 or 6 lines long; pollen, red; ovary, 12 to 15 lines long (together with the style, a little longer than the stamens); stigma, 4 lines in diameter; capsule, obovoid, 2 inches long, deeply and obtusely six-angled. Temperate regions of Japan, Maximowicz; Islands of the Corea, Oldham, 869.—*L. Brownii*,



Brown's Japan Lily (*L. japonicum* var. *Brownii*).



Japan Lily (*L. japonicum*).

Mielli, *Flore des Serres*, t. 47 (*L. japonicum*, Bury, *Hexand.*, t. 2) is a tall, large-flowered form, with from twenty-five to thirty leaves, and with larger flowers, which are more deeply tinged with purple on the outside.

8. *L. Krameri*.—Hort. Teutschel, Hook. fil., *Bot. Mag.*, t., 6,058.—Stem, 3 or 4 feet high, slender, terete, smooth, spotted with purple; leaves, distant from each other, scattered, fifteen or sixteen in number, linear-lance-shaped, acuminate, very shortly stalked, firm, green, five-nerved, with minute papillæ on the margins, 6 to 9 inches long, and 6 to 9 lines broad; perianth fragrant, horizontal, solitary, broadly funnel-shaped, whitish with a slight reddish tinge, 6 or 7 inches long, gradually narrowed from the base to the neck; segments, oblanceolate-oblong, in the expanded flower, falcate above the middle in the upper third part, the outer ones 15 or 16, and the inner ones 20 or 21, lines broad; filaments about half the length of the perianth; anthers, of a dull brown colour, 8 or 9 lines long; pollen, red; ovary, 15 to 18 lines long, half the length of the slightly curved style; stigma, 4 to 4½ lines in diameter. Japan; flowers in the beginning of July. Probably a hybrid between *L. speciosum* and *L. japonicum*, having leaves like those of the former, and perianth and anthers like those of the latter (v. v. ex hort. Wilsoni).—Var. *Barrianum*, Baker.—A smaller and slenderer form, with more numerous and more crowded leaves, which are three-nerved and from 2½ to 3 lines broad; perianth, white, 4 inches long; outer segments, 9 or 10 lines broad in the middle, inner ones, 15 to 18 lines broad; ovary, an inch long; style, ½ inch long; anthers, ½ inch long (v. v. in hort. Barr).



Kramer's Japan Lily (*L. japonicum* var. *Krameri*).

9. *L. nepalense*.—D. Don, *Wern. Trans.* iii., 412; *Prodr. Nep.* 52; Wallich, *Pl. Asiat. Rar.* iii., 67, 291, *Cat.* 5,078; Kunth, *Enum.* iv., 267—*L. ochroleucum*, Wall. in *hb. Lindley*.—Bulb, not known to me; stem, 2 or 3 feet high, straight, slender, smooth; leaves, thirty to fifty in number, scattered, of a shining green colour, ascending, smooth, lance-shaped, acute or linear, the lower ones 3 or 4 inches long, 6 to 9 lines broad in the middle, distinctly five to seven nerved,

the upper ones shorter and distant from each other; flowers, solitary, or few in an umbel, slightly fragrant (pedicels with bracts at the base in a whorl of reflexed leaves), or few in a loose raceme, the



Buff Nepal Lily (*L. nepalense*).

lower pedicels ascending, 2 or 3 inches long, nodding at the top; perianth, 4 or 5 inches long, broadly funnel-shaped, whitish-yellow, more or less tinged with purple on the inside, often marked with scattered dots; segments, oblanceolate-clawed, bluntish, in the expanded flower, falcate in the upper third part, 6 to 12 lines broad at two-thirds of their length from the base; stamens, shorter than the perianth by one-fourth; anthers, narrow, 6 or 7 lines long; pollen, yellow; ovary, 9 to 12 lines long, together with the style, a little longer than the stamens; capsule, ovate, 2 inches long, obtuse-angled. Temperate regions of the Western and Central Himalayas, from Gurwhal and Kumaon to Nepaul. Wallich, Thomson, Jacquemont, &c.

10. *L. candidum*.—*L. Sp.*, 433; *Bot. Mag.*, t. 278; *Red. Lil.*, t. 199; Bury, *Hexand.*, t. 38; Reich., *lc. Germ.*, t. 445; Kunth, *Enum.*, iv., 266.—Bulb, ovoid, perennial, large, yellowish; first leaves produced in winter, sessile, oblanceolate, 1½ to 2 inches broad; stem, 3 to 4 feet high, straight, smooth, blackish-green; leaves, 100 or more in number, scattered, ascending, green, acute,



Monstrous White Lily (*L. candidum* var. *monstrosum*).

Common White Lily (*L. candidum*).

two to five-nerved, with minute papillæ on the margin, those at the centre of the stem linear, 3 to 6 inches long, the lowest ones oblanceolate obtuse, the upper ones gradually smaller, the highest lance-shaped, 1 to 1½ inches long, and pressed close to the stem; raceme, short, deltoid, containing from six to twenty flowers, and, when fully expanded, 6 to 8 inches broad; lower flowers nodding; bracts, lance-shaped or linear; pedicels, ascending, the lowest ones 2 or 3 inches long, often with small bracts; perianth, white, fragrant, broadly funnel-shaped, 2 or 3 inches long, gradually widened from the base to the neck (where it is 1½ inches in diameter); segments, in the expanded flower, falcate in the upper third part, obtuse, downy at the apex, 6 to 9 (or, rarely 12) lines broad above the middle; stamens, shorter than the perianth by one-third; anthers, yellow, 5 or 6 lines long; style, together with the ovary, much longer than the stamens, nearly as long as the perianth. Southern Europe, from Corsica to Northern Persia and the Caucasus.—Var. *striatum*, *Flore des Serres*, t. 735, is a form with flowers streaked with purple on the outside.—Var. *spicatum*, Hort., is an abnormal form, the flowers being abortive, and the bracts dilated, white, and petaloid.—Var. *peregrinum*, Linn.—*L. peregrinum*, Mill. Dict., No. 2; Hayne, *Arzne.*, viii., 27; Sweet, *Brit. Flow. Gard.*, ser. ii., t. 367. A slenderer form, with a purple stem, narrower leaves, and segments of perianth narrower, longer, more acute, and more spatulate. A garden variety, long in cultivation, not yet found in a wild state.

11. L. Belladonna.—Hort. Leichtlin.—Stem, a foot or more high, slender, smooth, terete, green; leaves, about twenty in number, lance-shaped, very shortly stalked, distant from each other, green, smooth, acuminate, patent, $1\frac{1}{2}$ to 2 inches long, 3 or 4 lines broad in the middle; flowers, one to three in number, the terminal ones erect at first, the lateral ones horizontal when expanded; perianth, broadly funnel-shaped, 3 inches long, of a deep reddish colour on both sides, tinged with green at the base outside; tube, gradually widened from the base to the neck; segments, oblanceolate, not dotted, in the expanded flower falcate in the upper third part, 8 to 12 lines broad at two-thirds of their length from the base, the inner ones broader; stamens, shorter than the perianth by one-fourth; anthers, narrow, reddish, 3 or 4 lines long; style, slightly curved, and, together with the ovary, longer than the stamens; stigma, small. The plant has the habit of *L. speciosum*, with a perianth like that of *L. candidum*, only reddish. Described from Max Leichtlin's figure. It is, perhaps, a garden hybrid from *L. speciosum* and *L. longiflorum*.

12. Washingtonianum.—Kellogg, Proc. Calif. Acad., ii., 13; Wood, Proc. Acad. Phil., 1868, 166; Baker, Gard. Chron., 1871, 709, t. 142; Regel, Gartenf., t. 170; Flore des Serres, t. 1, 975.6.—*L. Bartramii*, Nuttall, herb.—Bulb, oblique, white, sub-rhizomatous, with small lance-shaped scales; stem, 3 to 5 feet high, terete, smooth, green, racemose at the top, bare below the raceme; leaves, in six to nine whorls, each containing from five to twelve leaves, or the upper ones scattered, oblanceolate, patent, sessile, smooth, 3 or 4 inches long, 8 to 12 lines broad above the middle, acute, green, gradually narrowed from the middle to the base; lateral veins, oblique and indistinct; raceme, from 6 inches to 1 foot long, containing from 12 to 20 flowers when expanded, 8 or 9 inches broad, pedicels ascending, the lower ones, 2 to 4 inches long; bracts, small, oblanceolate or linear; perianth, fragrant, funnel-shaped, whitish, $2\frac{1}{2}$ to 3 inches long, slightly tinged with reddish or purple on the inside; dots, few, small, lilac-coloured, scattered; segments, oblanceolate, 6 to 8 lines broad at two-thirds of their length from the base (from which point they are gradually narrowed to the base), falcate in the upper third or fourth part when the flower is fully expanded; stamens, shorter than the perianth by one-fourth; anthers, yellow, 5 or 6 lines long; ovary, 8 or 9 lines long, about one-third the length of the curved style. California, in woods on the Sierra Nevada, &c. — Jeffray, 1, 139; Bridges, 270; W. Lobb, 248.—Var. *purpureum*, Hort. Bull.—A smaller and slenderer form; stem, 12 to 18 inches high; leaves, 1 to $1\frac{1}{2}$ inches long; flowers, in umbels of four to eight; segments, more falcate, 5 or 6 lines broad, of a deep vinous-purple colour, and with small dots scattered over the entire inner surface; style, 9 to 12 inches long. California, in the Yosemite Valley. Extensively cultivated in English gardens in 1873.



Nevada Lily (*L. Washingtonianum*).

§ **Archelirion** (Baker).—Perianth, broadly funnel-shaped, or campanulate; segments, ovate, or oblong-lance-shaped, and deeply falcate in the expanded flower, dotted on the inner surface, and with papillæ on the lower part; groove on the keel very deep; stamens, diverging widely from the curved style.

13. L. tigrinum.—Gawl., Bot. Mag., t. 1, 237; Red. Lil., t. 395 and 475; Kunth, Enum. iv., 259.—*L. speciosum*, Andrews, Bot. Rep., t. 586, non Thunberg.—Bulb, perennial, globose, with oblong-lance-shaped, acute scales; stem, 2 to 4 feet high, blackish or brownish, with a white cobweb-like pubescence; leaves, deep green, scattered, smooth, ascending, firm, linear, 3 or 4 inches long, 3 to 6 lines broad in the middle, five to seven-nerved, the upper ones shorter, and bearing brownish red bulbils in the axils; raceme, consisting of three to ten (rarely twenty to twenty-five) flowers, broad, deltoid when expanded, sometimes 12 to 15 inches in length and breadth; bracts, small, ovate; pedicels, divaricated, straight, nodding at the top, the lower ones 3 or 4 inches long, and often furnished with bracts; perianth, 3 or 4 inches long, and of a brilliant red colour, or tinged with orange; segments, broadly falcate, acuminate, callous at the apex, downy, 9 to 18 lines broad below the middle, the inner ones much broader, all with large dark-purple dots on the inner

surface; claws, covered with numerous black-headed papillæ, groove on the keel very deep, and with pubescent edges; filaments, crimson, 2 to $2\frac{1}{2}$ inches long; anthers, blackish, 6 to 8 lines long; pollen crimson; ovary, green, 9 to 12 lines long; style, $1\frac{1}{2}$ to 2 inches long, very much curved. I have not seen the capsule. Temperate regions of Japan and China. Flowers at the end of July and during the whole of the month of August. For the forms in cultivation see T. Moore, Florist, 1873, 14.—*Splendens*, Flore des Serres, t. 1, 932; Wilson, Journ. Hort., 1873, 251, with a figure; Floral Mag., t., 509 (Leopoldi, Hort. is a large-flowered, very late-blooming form, with larger dots, broader leaves, and stem with less cobweb pubescence.—*Fortunei* is a form which does not bloom so late, and has the stem densely covered with less cobweb-like pubescence.—*Lishmanni*, Moore, Florist, 1873, 13, with a figure, is a form which has the dots confined to the central part of the segments, the upper part and the base being without dots.—*Erectum* has the pedicels less divaricated, and the flowers nearly erect.

14. L. oxypetalum, Baker.—*Fritillaria oxypetala*, Royle.—Ill. Him., 388? Hook., Bot. Mag., t. 4, 731; Lemaire, Fleur., t. 422.—



Snake's-head Lily (*L. oxypetalum*).

Lilium triceps, Klotzsch, Reise, Wald., 33, t. 93.—Bulb, oblong; scales, few, lance-shaped, acuminate, $1\frac{1}{2}$ inches long; stem, slender, terete, green, one-headed, smooth, 1 to $1\frac{1}{2}$ feet high; leaves, twenty to thirty in number, at first densely rosulate, scattered, ascending, green, smooth, lance-shaped or linear, 2 or 3 inches long, and 3 to 6 lines broad in the middle; perianth, horizontal, broadly funnel-shaped, 15 to 18 lines long; segments, oblong, acute, broadly imbricated, 8 or 9 lines broad in the middle, purplish, tinged with green on the back, dotted with purple on the lower half of the inner surface, and with numerous papillæ crowded together at the base; claw, short, deeply furrowed and bearded on the outside; stamens, shorter than the perianth by one-third; anthers, purplish, 3 or 4 lines long; filaments, diverging; ovary, club-shaped, 5 or 6 lines long; style, straight, shorter than the ovary; capsule, obovoid-oblong, 9 to 12 lines long, obtuse-angled; valves, emarginate at the apex. Temperate regions of the Western Hima-



Showy Japan Lily (*L. speciosum*).



Red-spotted Japan Lily (*L. speciosum* var. *rubrum*).

layas, Hoffmeister; Kumaon to Pindari, at an altitude of 12,500 feet; Strachey and Winterbottom.

15. L. speciosum.—Thunb., Linn. Trans., ii., 332; Bot. Reg., t. 2,000; Zuccarini, in Sieb. Fl. Jap., iii., 31, t. 12, and t. 13, fig. 1;

Kunth, Enum. iv., 259; Bot. Mag., t. 3,785; Flore des Serres, t. 276.—*L. lancifolium*, Mussche, Paxt. Mag., v., 267, with a figure, non Thunb.—Bulb, perennial, globose, brown or brownish-red; scales, lance-

shaped, an inch long, somewhat loosely set; stem, 2 or 3 feet high, straight, terete, smooth, green, or spotted with red; leaves, twelve to twenty in number, scattered, distant from each other, very shortly stalked (the stalk pressed close to the stem), oblong-lance-shaped, acute or acuminate, of a shining green colour, firm, smooth, rounded at the base, the lower ones 5 to 6 inches long, 15 to 18 lines broad in the middle, and with five to seven distinct nerves distant from each other; raceme, deltoid, containing from three to ten

flowers; pedicels, divaricated and furnished with bracts, the lowest 3 to 5 inches long, the central ones nearly erect, the lateral ones nodding at the top; perianth, 3 or 4 inches long; segments, ovate-lance-shaped, deeply falcate, 12 to 21 lines broad, the inner ones broader, white, usually more or less suffused with red, dotted with red on the inner surface, and with numerous papillæ; groove on keel deep and smooth; filaments, diverging widely, $2\frac{1}{2}$ to 3 inches long; anthers, narrow, 9 to 12 lines long; pollen, saffron or red; ovary, 1 inch long; style, slender, very much curved, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long; capsule, obovoid-oblong, 2 inches long, obtuse-angled, umbilicated at the apex. Temperate region of Japan, flowers in the beginning of August. For the forms in cultivation, see Masters, Gard. Chron., 1872, p. 1,522.—Punctatum, Lemaire (*lancifolium*, Paxt. Mag., v. t. 267, *albiflorum*, Hook., Bot. Mag., t. 3,785), is a form which has white flowers with red dots and papillæ; Tametomo, Zucc., and Spae. (*eximium*, Hort. olim; *L. Broussartii*, Morren, Mém. Acad. Roy. Brux., Feb., 1834, with a figure; *vestale*, Masters, loc. cit.), is a variety which has white flowers without dots; Krætzneri, Duchartre, has white flowers, the segments of which are marked with broad streaks of green on the outside.

16. *L. auratum*.—Lindl., Gard. Chron., 1862, 644b; Hook., Bot. Mag., t. 5,338; Flore des Serres, t. 1,528-1,531; Ill. Hort., ix., t. 338; Rev. Hort., 1867, t. 371; Miquel, Ann. Mus., iii., 156.—*L. Dexteri*, Hovey, Mag. Hort., Aug. 1862.—*L. Wittei*, Suringar in K. Koch, Wochen, 1867, 294.—*L. speciosum imperiale*, Hort., Siebold.—Bulb, exactly like that of *L. speciosum*; stem, 2 to 4 feet high, green, or tinged with purple, slender, terete, smooth; leaves, 20 to 30 in number, scattered, distant from each other, very shortly stalked (stalk pressed close to the stem), lance-shaped, acuminate, of a deep green colour, smooth, firm, five-nerved, the lower ones 6 to 9 inches long and 9 to 15 lines broad; raceme, deltoid, containing from three to ten flowers;

pedicels, divaricated and furnished with bracts; perianth, 5 to 7 inches long; segments, broadly falcate, 1 to 2 inches broad in the middle (the inner ones broader), white, usually streaked with yellow in the middle, and with scattered purple dots and papillæ on the lower part of the inner surface; groove on the keel, distinct and with smooth edges; filaments, 3 to $3\frac{1}{2}$ inches long; anthers, narrow, 9 to



Golden-rayed Japan Lily (*L. auratum*).



Red-rayed Japan Lily (*L. auratum* var. *rubrum vittatum*).

12 lines long; pollen, red; ovary, 12 to 14 lines; style, slender, very much curved, $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long; capsule, 3 inches long, oblong, longer and narrower than that of *L. speciosum*, emarginate at the apex.—Japan, Oldham, 186, Maximowicz. These are forms approaching *L. speciosum* with flowers streaked with red; some of these have from twenty-five to thirty broader leaves, and others from forty to fifty narrower leaves.—*L. Wittei*, Suringar, is a variety with white undotted leaves.

§ **Isolirion** (Baker).—Perianth, broadly funnel-shaped, standing erect for a considerable time, usually of a brilliant red or yellow colour; segments, oblong, lance-shaped, spatulate, or clawed at the base, with dots and papillose, lamellæ on the inner surface, and with a deep groove on the keel; stamens, diverging on every side from the erect style.

17. *L. philadelphicum*.—*L. Sp.* 435; Miller, Ic. t. 165, fig. 1; Bot. Mag., t. 519; Red. Lil., t. 104; Lodd. Bot. Cab., t. 976; Herb. Amat., t. 92; Bot. Reg., t. 594; Kunth, Enum. iv., 263.—Bulb, small, annual, stoloniferous; scales, fragile, thick, nearly club-shaped; stem, 1 to 3 feet high, green, slender, terete, smooth; leaves, twenty to thirty in number, lance-shaped, or linear, patent, slender, smooth, finely-nerved, sessile, the lower ones 3 or 5 inches long, 3 to 6 lines broad in the middle, arranged in whorls of four to six, or six to eight leaves, or few or many scattered; flower, solitary, terminal,



Canadian Whorl-leaved Lily (*L. philadelphicum*).

erect, or a few in an umbel; pedicels, 2 or 3 inches long, ascending, with a whorl of large leafy bracts at the base; perianth, 2 or 3 inches long, of a brilliant yellowish-red colour; segments, oblong-lance-shaped, 6 to 10 lines broad in the middle, with a distinct claw 6 to 8 lines long at the base, marked with large scattered purple dots on the lower half of the inner surface; groove, smooth, deep, margined on the edges by the revolute claws; stamens, shorter than the perianth by one-third; anthers, 5 or 6 lines long; pollen, red; ovary, 9 or 10 lines long, about half the length of the style; capsule, narrowly-obovoid, obtuse-angled. North America, from Canada to Carolina.—Var. *L. andinum*, Nuttall, Gen. i., 221.—*L. umbellatum*, Pursh, Flora i., 229.—Var. *wansharaicum*, Hort. Leichl.; Duchartre, Obs. 88.—Leaves, linear, all scattered. Rocky Mountains, Douglas, Bourgeau, &c.

18. *L. medeoloides*.—A. Gray, Mem Amer. Acad., vi., 415; Miquel, Ann. Mus. Lug. Bat., iii., 156.—*L. maculatum*, Thunb., Linn. Trans., ii., 334; Mem. Acab. Petrop., iii., 204, t. 5, fig. 1?—*L. canadense*, Thunb., Fl. Jap., 204?—Stem, 1 to 2 feet high, slender, smooth, terete, flexuose; leaves, mostly arranged in a single whorl of seven to fourteen; leaves, above the middle of the stem, oblanceolate, patent, tender, smooth, green, 4 to 6 inches long, 9 to 15 lines broad above the middle, acute, with two to four distinct lateral veins; there are sometimes a few scattered leaves above the whorl; flowers, solitary, or two to three in an umbel; pedicels, short, erect at the top; perianth, 12 to 15 lines long, erect, of an open funnel-shape, and brilliant orange-red colour, marked on the inside with a few claret-coloured dots; segments, lance-shaped, slightly falcate from the base, callous at the tip, channelled, downy, 3 to 4 lines broad in the middle, slightly spatulate at the base; groove, on the keel indistinct, smooth; filaments, half the length of the perianth; anthers, 4 to 5 lines long; ovary, club-shaped, 4 lines long; style, erect, a little shorter.—Japan, near Hakodadi, C. Wright. The Korean Island, Herschel, in inundated woods, where it flowers in June. Oldham, 873; it approaches most closely to *L. Martagon* and *L. avenaceum*; but is easily distinguished by its erect flowers, falcate (not revolute) segments, and short stamens and pistil.

19. *L. concolor*.—Salisb. Parad., t. 47; Kunth, Enum. iv., 259 and 673; Fisch and Mey. Ind. Sem. 1839, 55.—*L. sinicum*, Lindl. in Paxt. Flow. Gard., vol. ii., Misc. 115, t. 193; Lemaire, Ill. Hort., t. 100; Van Houtte, Flore des Serres, t. 1,206.—Bulb, ovoid, perennial, small; scales, few, whitish, oblong, acute; stem, slender, about a foot high, slightly pubescent, suffused with purple; leaves, twenty to thirty in number, ascending, scattered, lance-shaped, of a deep green colour, acute, $2\frac{1}{2}$ to 3 inches long, 4 to 6 lines broad in the middle, indistinctly seven-nerved, fringed with papillæ on the edges; flowers, one to three in number; pedicels, somewhat downy, purple, ascending, $1\frac{1}{2}$ to 2 inches long, sometimes bracteolated; perianth, 15 to 18 inches long, of a dark crimson colour, without spots on the inside,

paler on the outside; segments, broadly falcate, lance-shaped, 4 to 9 lines broad in the middle, callous at the tip, somewhat downy, slightly papillose at the base; groove on the keel, deep, with smooth edges; filaments, half the length of the perianth; anthers, 3 or 4 lines long; pollen, red; ovary, club-shaped, 5 or 6 lines long, deeply furrowed; style, club-shaped, 3 or 4 lines long, shorter than in any other species; capsule, 1 inch long, obovoid-oblong, obtuse-angled. China; flowers in the end of June.—*L. concolor*, Bot. Mag. 1,165, is a form in which the segments have a few dark spots on the inside, near the base.—Var. *L. Buschianum*, Lodd, Bot. Cab., t. 1,628.—*L. pulchellum*, Rev. Hort., 1862, 131, with a figure.—*L. concolor*, var. *sinicum*, Bot. Mag., t. 6,005. This variety sometimes grows taller, and has a larger and solitary bulb (the scales of which are few and broad), narrower dark green leaves, flowers sometimes four to six in number, segments of the perianth a little broader and of a brilliant crimson on the inner surface, the lower half of which is covered with numerous scattered small blackish dots; capsule, narrowly obovoid, $\frac{1}{2}$ inch long, umbilicated at the apex. Southern Siberia.—Var. *L. partheneion*, Sieb. and De Vriese, Tuinbow Flora, ii., 341, with a figure, scarcely differs from *L. Buschianum*, except in its slenderer habit, shining leaves, and caespitose bulbs. Japan.—*L. Coridion*, Sieb. and De Vriese, loc. cit., Duchartre, Obs. 42, is the same plant with yellow flowers.—Var. *L. pulchellum*, Fisch. and Mey., Ind. Sem. Petr., 1839, 56; Kunth, Enum. iv., 266, 676; Regel, Gartenfl., 1860, 81, t. 284, fig. 2.—Bulb, ovoid, scarcely an inch long; stem, very slender, about a foot high; leaves, twelve to twenty in number, narrowly linear, ascending, 2 to $2\frac{1}{2}$ inches long, and $1\frac{1}{2}$ to 2 lines broad; perianth, often solitary, red, 12 to 15 lines long; segments, oblan- ceolate, obtuse, 3 to 5 lines broad in the middle, covered on the lower half with numerous minute blackish dots; filaments, 5 or 6 lines long; ovary, 3 or 4 lines long, longer than the style. Eastern Siberia. A yellow-flowered variety is cultivated in Japan, Maximowicz; on stony hills in Chinese Mongolia, Meyer and Turczaninow, in herb. DC.



Crimson Erect-flowered Lily (*L. concolor*).

20. *L. bulbiferum* (Parkinson, Parad., 37, t. 2).—*L. Sp.* 433 ex parte; Jacq., Fl. Austr., t. 226; Bot. Mag., t. 1,018; Fisch. and Mey., Ind. Sem., 1839, 54; Kunth, Enum., iv., 264, 674; Regel, Gartenfl., 1872, 231, with a figure of the bulb.—Bulb, ovoid, perennial; scales, few, broad, acute; first shoots, broad, obtuse, tinged with red; stem, 2 to 4 feet high, straight, furrowed, spotted with purple, covered with white cobweb-like down on the upper part; leaves, fewer and more ascending than in *L. croceum*, the lower ones about 3 inches long and 3 to 6 lines broad in the middle (the upper ones drawn back), and bearing bulbils in the axils; flowers, in wild specimens, one to three in number, in cultivated plants often more numerous, and arranged in an umbel or deltoid raceme; pedicels, thick, short, spotted with purple, and covered with a white cobweb-like down; perianth, 2 to $2\frac{1}{2}$ inches long, erect, scentless, of a brilliant red colour, often tinged with orange at the bottom; segments, oblong-spathulate, 9 to 15 lines broad in the middle, the inner ones less clawed than in *L. croceum*, all with black dots, and numerous lamellæ and papillæ on the inner surface; groove, $\frac{1}{2}$ inch long, very deep, with pilose edges; filaments, 18 to 21 lines long; anthers, 3 or 4 lines long; pollen red; ovary, 7 or 8 lines long, half the length of the style; capsule, $1\frac{1}{2}$ inches long, obovoid, obtusely six-angled, umbilicated at the top. Central Europe, and South-eastern Scandinavia, flowering in our gardens amongst the earliest, blooming in June, before *L. croceum* and *L. davuricum*.—*L. latifolium*, Link, Enum., i., 321, is a large-growing garden form with broad leaves.—*L. humile*, Miller, Dict. No. 4, is a



Tiger Lily (*L. tigrinum*).

small form with narrow leaves.—*L. pubescens*, Bernh., Kunth, Enum., iv., 265, is probably a garden form with peduncles thickly covered with cobweb-like down. For its various forms, see Parkins, Parad., 38.

21. *L. croceum* (Fuchs).—Chaix. in Vill. Delph., i., 322; Kunth, Enum., iv., 265 and 675; Fisch. and Mey., Ind. Sem., vi., 56; Gran. Flor. France, iii., 182.—*L. bulbiferum*, DC., Fl. France, iii., 202; Bot. Mag., t. 36 (the figure much above the natural size).—*L. aureum*, Parkinson, Paradisus, 37, t. 3.—Bulb, globose, perennial; scales, large, ovate-lance-shaped, not narrowed at the middle; first shoots, broad, obtuse, tinged with red; stem, 3 to 6 feet high, stout, furrowed, green, spotted with purple on the upper part, more or less covered with cobweb-like down; leaves, 50 to 100 in number, scattered, very close, patent, or the lower ones slightly squarrose, linear, the lower ones 3 or 4 inches long, 3 or 4 lines broad, three to five-nerved, sessile, smooth, firm, never bearing bulbils in the axils; flowers, in wild specimens, often solitary, in cultivated plants often



Orange Lily (*L. croceum*).

ten to twenty in number, arranged in a deltoid raceme or umbel; pedicels, ascending, 2 or 3 inches long, covered with white cobweb-like down; perianth, erect, broadly funnel-shaped, 2 to $2\frac{1}{2}$ inches long when fully expanded, 3 inches broad, at first covered with white cobweb-like down on the outside; outer segments, oblong-lance-shaped, 8 or 9 lines long, broad below the middle, spatulate at the base; inner ones, ovate-lance-shaped, 12 to 14 lines broad below the middle, distinctly clawed at the base, all of a brilliant orange colour scarcely tinged with crimson, cuspidate at the apex, somewhat downy, imbricated in the expanded flower, marked with numerous dots and lamellate papillæ; groove $\frac{1}{2}$ inch long, very deep, with pilose edges; filaments, 15 to 18 lines long; anthers, 4 lines long; pollen, red; ovary, 8 or 9 lines long; style, 12 to 14 lines long; capsule, obovoid, $1\frac{1}{2}$ inch long, somewhat acutely angled. Switzerland, France, Northern Italy; long grown in gardens under many forms. Flowers in the beginning of July, after *L. bulbiferum*.

22. *L. davuricum*.—Gawl., Bot. Mag., sub. t. 1,210; Kunth, Enum., iv., 264; Regel, Gartenfl., t. 740, and 1872, 295.—*L. pennsylvanicum*, Gawl., Bot. Mag., t. 872.—*L. spectabile*, Link, Enum., i., 321; Reich., Ic. Exot., t. 30; Fisch. and Mey., Ind. Sem. vi., 58; Kunth, Enum., iv., 676; Regel, Gartenfl., t. 349, 1872, 231, with a figure of the bulb.—Bulb, globose, perennial; scales, small, fiddle-shaped, acute, white, brittle, contracted in the middle; first shoots, narrow, acute, tinged with brown; stem, 2 or 3 feet high, slender, green, slightly covered with white cobweb-like down in the upper part; leaves, twenty to fifty in number, ascending, sessile, linear, three-nerved, the lower ones 4 or 5 inches long, 3 or 4 lines broad in the middle, never bearing bulbils in the axils; flowers, in wild specimens, often solitary, in cultivated plants, few, in umbels or short racemes; pedicels, naked or slightly covered with cobweb-like down; perianth of a brilliant red colour, 2 to $2\frac{1}{2}$ inches long when fully expanded, 3 to $4\frac{1}{2}$ inches broad; segments, oblong-lance-shaped, 9 to 12 lines broad below the middle, scarcely imbricated in the expanded flower, less dotted and lamellated than in *L. croceum* and *L. bulbiferum*, spatulate at the base; groove, very deep, 8 or 9 lines long, with pilose edges; filaments, red, 18 to 21 lines long; anthers, 5 or 6 lines long; pollen, red; style, twice the length of the ovary; capsule, $1\frac{1}{2}$ to 2 inches long, obtuse-angled. Central and Eastern Siberia, from the Altai Mountains to Kamtschatka. It flowers in our gardens in July along with *L. croceum*, and after *L. bulbiferum*.—*L. umbellatum*, of most gardens, is a luxuriant garden form of *L. davuricum*. For its varieties, see Regel, Gartenfl., 1872, 295.



Umbel-flowered Lily (*L. umbellatum*) *davuricum*).

23. *L. elegans*.—Thunb., Mem. Acad. Petr., iii., 203, t. 3, fig. 2.—*L. bulbiferum*, Thunb., Linn. Trans., ii., 333.—*L. philadelphicum*, Thunb., Fl. Jap., 135.—*L. Thunbergianum*, Schultes fil., Syst. Veg. vii., 415; Lindl. Bot. Reg., 1839, t. 38; Maund. Bot., t. 158; Regel., Gartenfl. 1872, 296.—*L. aurantiacum*, Paxt. Mag., vii., 127, with a figure.—Bulb, like those of *L. bulbiferum* and *L. croceum*; stem, about a foot high, smooth, or slightly covered with cobweb-like down, or pilose, stout, furrowed; leaves, twenty to thirty in number, ascending, scattered, firm, deep green, smooth, distinctly five to seven nerved, the lower ones 3 to 4 inches long, the upper ones shorter, 6 to 12 lines broad in the middle, not bearing bulbils in the axils; perianth, usually solitary, 3 to 3½ inches long, when fully expanded 5 or 6 inches broad, of an orange-red colour; segments oblong, spatulate, obtuse, scarcely dotted, much less lamellated and papillose than those of *L. davuricum*, outer ones 12 or 13 lines, and inner ones 15 to 18 lines broad in the middle; groove, distinctly excavated, 8 or 9 lines long, with pilose edges; filaments 1½ to 2 inches long; anthers, 4 or 5 lines long; ovary, 1 inch long, half the length of the style; capsule, obovoid, 2 inches long, sub-acutely six-angled, one half longer than its breadth. Japan; it flowers in our gardens in the beginning of July, under very many forms, of which the following are the most notable:—Var. 1, *brevifolium*, Baker and Dyer, Gard. Chron., 1872, 1,356.—*L. alternans*, hort.; leaves, broader and shorter, the lower ones 2 to 2½ inches, the upper ones 1 to 1½ inches long, all 7 to 9 lines broad, and of a deep green colour; perianth, less open, of a pale red colour throughout, with a few black dots at the bottom; filaments and style a little longer. Var. 2, *bicolor*, Moore, Floral Mag., t. 104.—*L. pictum*, hort. Siebold.—*L. aurantiacum*, hort. Krelage; stem, scarcely a foot high; leaves, about forty in number, narrower, the lower ones 4 to 6 lines broad; perianth, 3 to 3½ inches long; segments, broader than in any other variety (the inner ones 18 to 21 lines broad), with yellow centre, red sides, and a few dots near the base.—Var. 3, *pardinum*, Moore, Florist, 1861, 121, with a figure. This scarcely differs from var. 2, except in having a taller stem (2 to 3 feet), and the flowers few and in an umbel. Var. 4, *alutaceum*, Baker and Dyer, Gard. Chron., loc. cit.—*L. Thunbergianum aureum nigro-maculatum*, Flores des Serres, t. 1,627; stem, dwarf; leaves about thirty in number; flowers, solitary; perianth of a pale apricot colour; inner segments, 12 to 13 lines broad, with numerous purplish dots on the lower half.—Var. 5, *armeniaceum*, Baker and Dyer, loc. cit. Stem, about a foot high; leaves, thirty to forty in number, the lower ones linear; flowers one or two in number, orange, not dotted, and without lamellæ or papillæ; segments 9 to 12 lines broad.—Var. 6, *citrinum* hort., Wilson, scarcely differs from *L. armeniaceum*, except in having the stem 2 to 2½ feet in height, the leaves lance-shaped, and flowers two to three in number.—Var. 7, *sanguineum*, Lindl., Bot. Reg., 32, t. 50. Stem, 1 to 1½ feet high; leaves, about forty in number, lance-shaped; flowers one to two in number; segments broad, blood-red, slightly tinged with orange, and with a few small dots near the base; papillæ and lamellæ nearly obsolete.—Var. 8, *atrosanguineum*, Baker and Dyer, loc. cit.—*L. coruscans*, hort. Stem, 1 to 1½ feet high; leaves, lance-shaped; flowers, usually solitary; segments, broad, deep red, with numerous dots on the lower half; papillæ and lamellæ, numerous and only slightly raised.—*L. hæmatochroum*, Lemaire, Ill. Hort., t., 503, is a similar form, with darker livid red flowers.—Var. 9, *fulgens*, Morren, in Spæe Mem., 29; Lemaire, Ill. Hort. t. 657, approaches *L. davuricum*. Stem, 1 to 1½ feet high; leaves, about forty in number, linear; flowers, often four to six in number, of a deep red colour; dots, lamellæ, and papillæ, almost obsolete.—*L. venustum*, Kunth, Flore des Serres, t. 652, is a similar form with a more brilliant flower more tinged with orange.—*L. Wilsoni*, hort., according to Max Leichtlin, is probably a hybrid between *L. elegans* and *L. speciosum*.



Thunberg's Orange Lily (*L. (Thunbergianum) elegans*).

24. *L. Catesbæi*.—Walt., Fl. Carol., 123; Bot. Mag., t. 259; Lodd., Bot. Cab., t. 807; Sweet, Brit. Flow. Gard., ser. ii., t. 185; Kunth, Enum., iv., 263.—*L. spectabile*, Salisb., Stirp. Rar., t. 5, non Link.—*L. carolinianum*, Catesby, Car., ii., t. 58, non Michx.—Bulb, exactly like that of *L. philadelphicum*; stem, 1 to 2 feet high, slender, terete, smooth, green; leaves, twenty to thirty in number, scattered, ascending, smooth, green, lance-shaped, or linear, the

lower ones 2 or 3 inches long, 4 to 6 lines broad, the upper ones gradually smaller; perianth, solitary, erect, broadly funnel-shaped, 3 or 4 inches long, of a brilliant orange-red; segments, oblong-lance-shaped, 6 to 12 lines broad in the middle, distinctly cuspidate for some length, and with purple spots scattered over the inner surface; claw, channelled at the base, 9 to 15 lines, with revolute margins; filaments, 2½ to 3 inches long; anthers, narrow, 4 to 6 lines long; pollen, red; ovary, 9 to 12 lines long; style, slender, twice the length of the ovary. North America, from Georgia and Carolina to Florida.

§ **Martagon** (Endl.).—Flowers, in racemes, nodding, dotted, usually of a brilliant red or orange colour; perianth, broadly campanulate; segments, lance-shaped, deeply falcate; grooves, deep; stamens, diverging on all sides from the curved style.



Catesby's Orange Lily (*L. Catesbæi*).

25. *L. canadense*.—Linn. Sp., 435; Bot. Mag., t. 800 and 858; Kunth, Enum., iv., 258; Bury, Hexand., t. 12; Flore des Serres, t. 1,174.—*L. penduliflorum*, DC. in Red Lil., t. 105.—*L. pendulum*, Spæe, Mem., 28.—*Martagon sive Lilium canadense maculatum*, Parkins, Parad., 32., t. 2.—Bulb, annual, emitting runners 5 or 6 inches long; scales, thick, obtuse, scarcely ½ inch long; stem, 1½ to 2 feet high, slender, smooth, terete, green leaves, often arranged in four or five regular distant whorls of four to eight leaves (the whorls being, however, sometimes more or less broken up), oblanceolate, acute, 3 or 4 inches long, 6 to 9 lines broad above the middle, green, slender, five to seven-nerved, the veins sometimes ciliated; flowers, solitary, or a few in an umbel or corymb; pedicels, 2 to 6 inches long, nodding very much at the top, sometimes bracteolate; perianth, 2 to 2½ inches long, broadly funnel-shaped, brilliant orange-red; segments, oblanceolate, 6 or 7 lines broad, falcate above the middle, with numerous claret-coloured spots on the inner surface, lamellated in the upper part; groove, distinctly sunk, with smooth edges; filaments, shorter than the perianth by one-third; anthers, 4 to 6 lines long; ovary, 8 or 9 lines long, a little shorter than the almost straight style; capsule, turbinate, obtuse-angled, 1½ inch long, not umbilicated at the apex; septa, delicate. North Eastern America, from Canada to Georgia. It recedes (along with *L. monadelphum*) from the *Martagon* section towards *Enlirion*, the funnel-shaped perianth, in the expanded flower, being revolute only above the middle.—Var. *penduliflorum*, hort., Leicht., is a form



Canadian Bell-flowered Lily (*L. canadense*).

with segments revolute to or below the middle.—Var. 1, *L. parvum*, Kellogg, Roc. Calif. Acad., ii., t. 52; Regel, Gartenflora, t. 725; Duchartre, Obs. 98.—Bulb and perianth, like those of the type, but in our gardens the plant has a smaller and slenderer habit; stem, green, 1 to 1½ feet high; upper leaves, usually scattered; flowers, much less nodding, sometimes nearly erect; perianth, 15 to 18 lines long, brilliant orange-red, with numerous dots; segments, acute, 3 to 5 lines broad, falcate above the middle; anthers, oblong, 2 or 3 lines long; ovary, 3 or 4 lines long, half the length of the almost straight style. California, on the Sierra Nevada chain, at an altitude of 6,000 feet. Jeffray, 1,283. According to Kellogg, it attains a height of 5 feet, and bears as many as fifty flowers.—Var. 2, *Walkerii*, Wood, Proc. Amer. Acad., 1868, 166.—Stem, 3 feet high, or more; leaves, tender, narrower, arranged in regular whorls of seven or eight leaves, the whorls being very distant from each other; lower leaves, 4 or 5 inches long, 4 or 5 lines broad, the veins very slender in comparison with the mid-rib; flowers, more numerous, arranged in an elongated raceme; perianth, funnel-shaped, 10 to 15 lines long; segments, 2½ to 3 lines broad, falcate only at the apex; stamens, a little shorter than the perianth; anthers, oblong, 1½ line long; ovary, 4 lines long, half the length of the straight

style; stigma, very small. California, Walker, Bridges, 268.—Var. 3. *Parviflorum*, Hook., *Flor. Bor. Am.*, ii., 281; L. Sayii, Nuttall, MSS.; L. canadense var. minus, Wood, *Proc. Acad. Phil.*, 1868, 166.—Stem, 2 or 3 feet high; leaves, in whorls, or most of them scattered; oblanceolate, tender, the lower ones 6 to 12 lines broad; flowers, solitary, or a few in an umbel, nodding; perianth, 18 to 21 lines long; segments, oblanceolate, bluntish, deeply reflexed from the middle, where they are 3 or 4 lines broad; stamens, shorter than the perianth by one-third; anthers, 3 lines long; ovary, 6 lines long, as long as the style. British Columbia and Oregon, Nuttall, Douglas, Lyall, &c. Bulb, like that of L. canadense; perianth, more revolute, but smaller than in L. pardalinum and L. superbum.

26. L. pardalinum.—Kellogg, *Proc. Calif. Acad.*, ii., 12, with a figure; Duchartre, *Obs.* 97.—Bulbs (annual or biennial), shortly rhizomatous; scales, few, lax, lance-shaped, acute; stem, 3 or 4 feet high, terete, green, smooth; leaves, often arranged near the middle of the stem in three or four whorls of nine to twelve leaves, the whorls distant from each other; upper leaves, few, scattered, oblanceolate, of a shining green, 3 or 4 inches long, acute, 9 to 12 lines broad in the middle, smooth, tender; lateral veins, sunk; flowers, three to six in number, arranged in a corymb or lax umbel; pedicels, elongated, nodding at the top; perianth, 2 to 2½ inches long, of a brilliant red, orange at the base; segments, lance-shaped, bluntish, 6 to 9 lines broad in the middle, deeply revolute, the lower half abruptly orange, covered with large purplish-brown spots, and slightly lamellate-papillose; groove, deep, with smooth edges; stamens, shorter than the perianth by one-third; anthers, red, 4 or 5 lines long; style, 12 to 14 lines long, scarcely longer than the ovary; capsule, oblong, umbilicated at the apex, with somewhat acute angles. California, W. Lobb, 249, &c.—Var. 1. *californicum*, hb. Lindley: *Florist*, 1873, t. 33 (by an error the figure there is subscribed "Washingtonianum")—Leaves, fewer, smaller, and in less regular whorls; flowers, one to three in number, longer, 3 or 4 inches long; segments, bluntish, 9 to 12 lines broad, the upper half, as in the type, of a brilliant scarlet, the lower half abruptly orange, with large purplish-brown dots; filaments and style, 1½ to 2 inches long. California, Hartweg. (I have seen the original specimen in Lindley's herbarium, now at Cambridge.)—Var. 2. *pallidifolium*, Baker.—L. *puberulum* hort. Leichtlin, non Torrey.—Taller, in our gardens the stem being 4 or 5 feet high, green and smooth; leaves, 50 to 80 in number, oblanceolate, smooth, pale green, firmer than those of L. pardalinum, distinctly five to seven-nerved, the upper ones usually in regular whorls, the lower ones scattered at the base, at the time of flowering; flowers, if more numerous, in a loose raceme or umbel; pedicels, elongated, nodding at the top; perianth, 2 to 2½ inches long; segments, more acute, 5 or 6 lines broad in the middle, deeply reflexed below the middle, of a paler red on the inner surface than in L. pardalinum, and more tinged with yellow at the base, with fewer and smaller dots; stamens, shorter than the perianth by nearly one-third. California, hort.; Leichtlin.—Var. 3. *Bourgæi*, Baker, differs from *pallidiflorum*, in the few specimens I have seen, by having narrower leaves all arranged in regular whorls, and distinctly three to five-nerved, the veins on the lower part of the inner surface ciliated, and the dots more numerous and larger, after the manner of L. pardalinum. Banks of Lake Winipeg, Bourgeau. Very recently introduced into English gardens.



Superb Orange Lily (*L. superbum*).

27. L. superbum.—L. Sp., 434; Bot. Mag., t. 936; Red. Sil., t. 103; Bury, Hexand., t. 36; Kunth, *Enum.*, iv., 258; *Flore des Serres*, t. 1, 014-15.—Bulbs, large, caespitose, globose, perennial; scales, numerous, acute, closely imbricated, tinged with red; first leaves, firm, glaucous green; stem, 4 to 6 feet high, stout, tinged with purple; leaves often arranged in three or four whorls of eight to ten leaves, few or numerous scattered, narrowly lance-shaped, acute, somewhat firm, of a dull green colour, smooth, distinctly three to five-nerved, the lower ones 4 or 5 inches long, 6 to 9 lines broad in the

middle; flowers, often six to twelve in number, sometimes twenty to forty, arranged in a deltoid panicle 9 to 12 inches broad, pedicels nodding at the top, the lower ones 3 to 5 inches long, divaricated; perianth, 3 or 4 inches long, brilliant orange-red; segments, acute, lance-shaped, 6 to 9 lines broad, deeply revolute, with conspicuous claret-coloured slightly lamellated dots on the lower half; groove, deep, with smooth edges; filaments, 2 to 2½ inches long, very divergent; anthers, reddish, 6 to 7 lines long; ovary, 9 to 12 lines long, a little shorter than the curved style; capsule, obovoid, obtusely six-angled. From Canada to Georgia and Carolina, in woods and marshy places.—Var. L. *carolinianum*, Michx., *Flora*, i., 197; Bot. Mag., t. 2,280; Bot. Reg., t. 580; Kunth, *Enum.*, iv., 258.—L. *Michauxii*, Poir., *Ency.*, iii., 457.—L. *Michauxianum*, Schult. fil., *Syst.*, vii., 258.—L. *autumnale*, Lodd., *Bot. Cab.*, t. 355.—Bulb, exactly like that of the type; first leaves appearing earlier, of a shining green, and thicker; leaves much fewer, broader, and shorter, often five or six in number, arranged in whorls near the middle of the stem, the others scattered; stem, 1 to 2 feet high, bearing one or few heads; perianth, exactly like that of the type, but the segments are sometimes broader and more obtuse. From Virginia and Carolina to Florida, flowering in our gardens in August, among the late-flowering kinds.

28. L. Roezlei.—Regel, *Gartenfl.*, t. 667.—L. canadense, var. *Hartwegii*, Baker, *Gard. Chron.*, 1871, 321.—Bulb, perennial, rhizomatous; stem, 2 or 3 feet high, slender, smooth; leaves, in the specimens I have seen, twenty to thirty in number, a few of the upper or lower ones in whorls, or all scattered, ascending, firm, glaucous, narrowly linear, acute, indistinctly three to five-nerved,



Roez's Orange Lily (*L. Roezlei*).

the lower ones 4 or 5 inches long, 3 or 4 lines broad in the middle; flowers, one to ten in number, if several, in a corymb or raceme; pedicels, elongated, nodding at the top; perianth, 2 or 3 inches long, brilliant orange-red; segments, acuminate, 5 or 6 lines broad in the middle, lower half yellow, with several purple spots, closely reflexed above the base; groove, distinct, with smooth edges; stamens, shorter than the perianth by one-third; anthers, 5 or 6 lines long; style, curved, twice as long as the ovary; I have not seen the capsule. Rocky Mountains in the Utah territory, introduced by Roez

into European gardens. California on the Santa Cruz Mountains, Hartweg, 2,000. Easily distinguished from allied forms, by having narrow acute leaves and perianth segments.

29. L. columbianum.—Hanson in hort., Leicht.—Bulb, ovoid, perennial, small white, acute, with lance-shaped scales; stem, 1½ to 2 feet high, slender, green, smooth; leaves, few, the lower ones in whorls of four or five leaves, the upper ones scattered, oblanceolate, acute, 1½ to 2 inches long, 5 or 6 lines broad in the middle; flowers, two or three in number, in an umbel; pedicels, slender, 2 to 4 inches long, nodding at the top; leaves, reflexed, bracted at the base, sometimes bracteolate; perianth, 1½ to 2 inches long, brilliant orange-red; segments, lance-shaped, closely reflexed from the middle, where they are 4 to 6 lines broad; inner surface covered thickly with purple dots; groove, shallow, smooth; stamens, shorter than the perianth by one-third; anthers, 3 or 4 lines long; style, scarcely longer than the ovary.—Oregon, W. Lobb, 350, hort., Leichtlin. It scarcely differs from L. canadense var. *parviflorum*, except in the bulb not being rhizomatous.

30. L. Humboldtii.—Roezl and Leicht., *Duchartre*, *Obs.* 105; Regel, *Gartenfl.*, t. 724; *Flore des Serres*, t. 1973-4.—L. *Bloomerianum*, hort. Aug.—Bulb, large, 2 to 4 inches in diameter, oblique, perennial, not rhizomatous; scales, few, ovate-lanceolate, acute, 2 or 3 inches long; stem, terete, stout, 4 or 5 feet high, smooth or downy, green, with reddish spots; leaves, usually in four to six regular whorls of ten to fifteen leaves, oblanceolate, the lower ones 4 or 5 inches long, 9 to 12 lines broad above the middle, acute, firm, of a deep green colour, undulated; lateral veins, distinct, sometimes ciliated on the lower part of the inner surface; flowers, often six to ten in number, sometimes thirty to forty, in a deltoid panicle, which is a foot across when fully expanded; pedicels, divaricated, nodding at the top, the lower ones 3 to 5 inches long; leaves, oblanceolate, very much reflexed, bracted; perianth, 3 or 4 inches long, brilliant orange-red, greenish at the base outside; segments, acute, 9 to 12 lines

broad in the middle, closely reflexed above the base, with numerous claret-coloured dots on the inner surface, slightly lamellate-papillose near the base; groove, distinctly excavated, with smooth edges; filaments, $1\frac{1}{2}$ to 2 inches long; anthers, red, 6 to 8 lines long; style, 6 or 7 lines long, about one-third the length of the ovary; capsule large, obovoid, acutely six-angled, as in *L. Martagon*. California, on the Sierra Nevada, Roezl, in hort. Leichtlin.—*L. canadense*, var. *puberulum*, Torrey, Bot. Whipple, 90 (Hartweg 2,004), is a form of this species which has the stem and under-surface of the leaves puberulous.—Var. *ocellatum*, Kellogg, Proc. Calif. Acad., v. 88, t. 4, from the island of Santa Rosa, is a form with a yellow perianth, marked on the inside with conspicuous purple dots.

31. *L. Martagon*.—*L. Sp.*, 435; Jacq., Austr., t. 351; Bot. Mag., t. 893 and 1,634; Red., Lil., t. 146; Eng. Bot., t. 279, edit. 3, t. 1,518; Reich., Ic. Germ., t. 451.—Bulb, ovoid, $1\frac{1}{2}$ to 2 inches long, yellowish, perennial, with very numerous narrow scales; stem, 3 to 6 feet high, terete, smooth or puberulous in the upper part, green or spotted with purple; leaves, mostly in two to four whorls of six to nine leaves, the upper ones (rarely all) scattered, horizontal, oblanceolate, spatulate, sessile, tender, the lower ones 4 to 6 inches long, 12 to 15 lines broad above the middle, tender (with three to five distinct distant veins on each side of the mid-rib), smooth or pubescent; central internodes, 6 to 9 inches long; raceme, lax, elongated,



Humboldt's Orange Lily (*L. Humboldtii*).



Flower-spike of Martagon Lily.



Common Martagon Lily (*L. Martagon*).

containing from three to twenty flowers; bracts, small; pedicels, nodding when bearing flowers, the lowest ones 1 to 3 inches long; perianth, fragrant, claret-coloured, 15 to 18 lines long, pubescent on the ridge outside; segments, lance-shaped, very revolute, with numerous livid purple dots on the inside; claws, slightly lamellated (groove deep, with papillose edges), hooded, thick, and puberulous at the apex; filaments, 8 to 10 lines long, twice the length of the anthers; pollen, red; ovary, 5 or 6 lines long, shorter than the very curved style by one-third; capsule, turbinate, acute-angled, umbilicated at the apex. Central and Southern Europe, to Siberia and Japan, flowering in our gardens at the end of June and beginning of July. For the forms of this species, see Parkinson, Parad., 31.—*L. hirsutum*, Miller, Dict., No. 10 (*L. Milleri*, Schultes, Obs., 67), is a stout form with a puberulous stem.—*L. glabrum*, Spreng, Syst., ii., 62, is a form with white flowers, a smooth stem, shining green leaves, and yellow pollen. There are also forms with claret and flesh-coloured undotted flowers.—Var. *L. Cattanae*, Visiani, Fl. Dalm., Suppl. 32, t. 3.—Segments of the perianth, thicker than in any other species, of a dark, purplish claret colour; dots, nearly obsolete. Dalmatia, Hort., Leichtlin.—*L. Marticum dalmaticum*, Maly, is a similar form, or the same.

32. *L. avenaceum*.—Fischer, Maxim. in Regel, Gartenfl., 1865, 290, t. 485.—*L. Martagon*, Led., Fl. Ross., iv., 149, ex parte.—Bulb, globose, small, perennial; scales, numerous, lance-shaped; stem, smooth, terete, 18 inches to 2 feet high; leaves, usually in a whorl

of six to nine, leaves at the middle of the stem, a few scattered between the whorl and the raceme, seldom in two whorls or all scattered, horizontal, oblanceolate, 3 or 4 inches long, 6 to 18 lines broad above the middle, smooth, tender, similar in texture and venation to those of *L. Martagon*; flowers, few, sometimes sub-umbellate; bracts, small; pedicels, nodding at the top, 2 or 3 inches long; perianth, slightly fragrant, 15 to 18 lines long, of a brilliant yellowish-red; segments, lance-shaped, 4 to 6 lines broad in the middle, hooded at the apex, covered with minute dots on the inside; groove, smooth and deep; filaments, 9 to 12 lines long; anthers, 3 or 4 lines long; ovary, 4 or 5 lines long, half the length of the curved style. Kamtschatka, Manchuria, Kurile Islands, and Japan; Pallas, Maximowicz, &c. It has the habit and foliage of *L. Martagon*, and the yellowish-red perianth of *L. canadensis*.

33. *L. Hansonii*, Leichl.—Bulb, like that of *L. tigrinum*, globose, perennial, compact, whitish; stem, 3 or 4 feet high, slender, smooth, terete, stout, green; leaves, oblanceolate, acute, green, tender, smooth, with three distinct, oblique, tender, distant, lateral nerves, usually collected in a whorl of eight to twelve patent sessile leaves



Bent-styled Lily (*L. avenaceum*).

at the middle of the stem, the others scattered, 4 or 5 inches long, 8 to 12 lines broad above the middle, gradually narrowed from the middle to the base; flowers, four to ten in number, in a loose raceme or crowded into an umbel; pedicels, erect-patent, $1\frac{1}{2}$ to 2 inches long; bracts, small, ovate-lance-shaped; perianth, 15 to 18 lines long, of a brilliant reddish-orange; segments, thick, lance-shaped, 4 or 5 lines broad in the middle, deeply falcate-revolute, dotted with purple on the lower half inside; groove, long, smooth, very deep; filaments, 10 to 12 lines long, yellow; anthers, narrow, 4 or 5 lines long; pollen, yellow; ovary, club-shaped, deeply channelled, 5 or 6 lines long, a little shorter than the style. Japan, hort., Leichtlin; coming into growth and flowering amongst the earliest. This species is midway between *L. Martagon* and *L. canadense*.

34. *L. monadelphum*.—M. Bieb., Flor. Taur., i., 267; Cent. Pl. Ross., t. 4; Gawl. Bot. Mag., t. 1,405; Kunth, Enum., iv., 260; Fisch. & Lall., Ind. Sem. Petrop., 1839, 57; Reich. Exot., t. 89; Regel, Gartenfl., t. 733.—*L. Loddigesianum*, Schultes, fl. Syst. Veg., vii., 416; Kunth, Enum., iv., 261; Lemaire, Jard. Fleur., t. 204; Paxt. Flow. Gard., t. 58.—*L. Szovitsianum*, Fisch. & Lall., Ind. Sem. Petr., 1839, 58; Kunth, Enum., iv., 674; Regel, Gartenfl., t. 436; Flore des Serres, 507.9.—*L. colchicum*, Steven.—Bulb, ovoid, whitish, perennial; scales, numerous, lance-shaped; stem, 2 to 5 feet high, stout, green, puberulous; leaves, thirty to fifty in number, scattered, ascending, linear lance-shaped, or oblanceolate, green, distinctly many-nerved, the central ones 3 or 4 inches long,



Crimson-anthered Lily (*L. Szovitsianum*).



Caucasian Lily (*L. monadelphum*).

6 to 12 lines broad in the middle, pubescent on the back and edges; raceme, usually containing from two to sixteen (sometimes twenty to thirty) flowers; peduncles, $1\frac{1}{2}$ to 2 inches long, nodding at the top; bracts, large, lance-shaped, in pairs; perianth, fragrant, of a sulphur-yellow, $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long; segments, oblanceolate, falcate

above the middle, 9 to 12 lines broad, tinged with purple at the base and apex, and having a few small blackish dots on the inner surface, not papillose; groove, smooth and shallow; filaments, 18 to 21 lines long, green, flattened from the base, valvate at the base of the upper third of their length; anthers, 5 or 6 lines long; pollen, red; ovary, 7 or 8 lines long, half the length of the almost straight style; capsule, obovoid, 18 to 21 lines long, obtuse-angled, umbilicated at the apex. The Caucasus, and northern Persia, flowering in our gardens in June, amongst the earliest. The original plant of Bieberstein is merely a form which has the filaments united below. This species recedes from the others of this group towards *Eulirion*, which it resembles in the form of the perianth, and the absence of papillae, &c. — Var. *L. Ledebourii*, Baker; *L. pyrenaicum*, Led. Fl. Ross, iv., 151, non Gouan. — A dwarfer variety with narrower leaves (80 to 100 in number), linear, seven-nerved, 4 to 6 lines broad in the middle, scarcely pubescent underneath; segments of the perianth, 6 to 8 lines broad. Caucasus, Gildenstadt, C. A. Meyer. (I have seen it growing in Kew Gardens.)

35. *L. polyphyllum*.—D. Don in Royle, Ill. Him. 388; Kunth, Enum. iv., 677; Klotzsch, Reise Wald., 53.—*L. punctatum*, Jacquem. Duchartre, Obs. 76.—Stem, smooth, terete, 2 to 4 feet high; leaves, forty to sixty in number, ascending, scattered (or the lower ones sometimes whorled, according to Jacquemont), green, sessile, acute, smooth, minutely papillose on the edges, resembling those of *L. Martagon* in their texture and venation, the lower ones oblanceolate, 4 or 5 inches long, 6 to 9 lines broad above the middle, the upper ones narrower and linear; peduncle, naked for 5 or 6 inches below the raceme; raceme, lax, containing from four to ten flowers, branches often opposite; bracts, in whorls; pedicels, nodding at the top when bearing flowers, the lower ones 3 to 5 inches long; perianth, 18 to 21 lines long, fragrant, "of a livid-yellow, with claret-coloured dots" (Jacquemont); segments, oblanceolate, 2 or 3 lines broad, revolute from the middle; filaments, 15 to 16 lines long; anthers, 4 lines long; ovary, 6 or 7 lines long, one-third shorter than the very curved style; capsule, obovoid, 12 to 15 lines long, sub-acute-angled. Temperate region of the Western Himalayas (Kunawar, Kashmir, &c.); Royle, Thomson, Jacquemont.

36. *L. ponticum*.—K. Koch, Linnæa xxii., 234; Duchartre, obs. 22.—Bulb, ovoid, an inch in diameter; scales, numerous, lance-shaped; stem, 1½ to 2 feet high, slender, faintly pubescent in the upper part; leaves, 20 to 30 in number, scattered, lance-shaped, firm, ascending, 15 to 18 lines long, 4 to 5 lines broad, the upper one narrower; veins, numerous, distinct; lower part of the inside and the edges pubescent; flowers, 1 to 6 in number, nodding, 18 to 21 lines long, yellow; segments, oblanceolate, reflexed below the middle, where they are 3 or 4 lines broad, scarcely dotted; groove, shallow; filaments, 3 or 4 lines long, half the length of the perianth; ovary, 6 lines long, a little shorter than the club-shaped style; capsule, 1 inch long, obovoid, obtuse-angled. Mountains of Asia Minor, at an altitude of 6,000 to 7,000, K. Koch; the mountainous region of Lazistan, Balansa, Plantes de l'Orient, anno 1866, no. 1,531. It has the leaves and habit of *L. monadelphum*; but is more slender, and the typical perianth of this species is more revolute. Regel's figure (Gartenflora, t. 436), which is referred by K. Koch to *L. ponticum*, in my opinion represents the true *L. Szovitsianum*. In De Candolle's herbarium there is a narrow-leaved specimen from Lazistan, in which the leaves are more crowded, the lower ones 3 inches long, and 3 or 4 lines broad, resembling a variety of *L. monadelphum*.

37. *L. carniolicum*.—Bernh. in Mert and Koch., Deutsch. Flora, ii., 536; Kunth, Enum. iv., 260; Reich. Ic. Flor. Germ., t., 990; Parl. Flor. Ital., ii., 404. — *L. chalcadonicum*, Linn. sp. Plant., 434, ex parte; Jacq. Fl. Austr. Suppl., t., 20; *Martagon pannonicum* sive *exoticum flore spadiceo*, Parkins., Parad., 35.—Bulb, perennial, ovoid; scales numerous, lance-shaped; stem, 2 or 3 feet high, green, puberulous; leaves, thirty or forty in number, scattered, lance-shaped, or linear-lance-shaped, the lower ones 2 or 3 inches long, 6 to 9 lines broad in the middle, flat, distinctly many-nerved, and distinctly ciliated on the margins and the veins of the lower part inside; upper leaves

shorter; pressed close to the peduncle; raceme, few-flowered; pedicels, 2 or 3 inches long, nodding at the top, sometimes bracteolated; perianth, 1½ to 2 inches long, if a brilliant yellow or vermilion; segments, oblanceolate, closely revolute, 5 or 6 lines broad in the middle, with numerous minute dots on the inner surface, papillose downwards; groove distinctly excavated; filaments, 8 to 12 lines long; anthers, 5 or 6 lines long; pollen, saffron; ovary, 5 or 6 lines long, as long as the club-shaped style; capsule, 1½ inches long, obtuse-angled. Lombardy, Istria, Dalmatia, Illyria, and Bosnia; flowering in June.

38. *L. testaceum*.—Lindl. Bot. Reg. 1842, Misc., 51; 1843, t. 11; Paxt. Mag. Bot., 1843, 221, with a figure; Kunth, Enum. iv.,



Buff Lily (*L. testaceum* var. *excelsum*).



Flat-flowered Yellow Lily (*L. testaceum*).

673; Flore des Serres, t., 39; Regel, Gartenfl., t. 349.—*L. excelsum*; Walp. Ann., xi., 110.—*L. isabellinum*, Kunze, in Mohl. and Schlecht., Bot. Zeit., i. 609.—Bulb, globose, perennial; stem, 4 or 5 feet high, slightly downy, tinged with brown; leaves, sixty to a hundred in number, scattered, very close, linear, ascending, firm, dull green, three to five-nerved, the lower ones 3 or 4 inches long, 3 or 4 lines broad in the middle, the margins covered with whitish down, the upper ones gradually smaller, 1 to 1½ inches long, pressed close to the stem, more distinct, being at some distance from the flowers; flowers, three to ten in number, in an umbel or raceme, fragrant; pedicels, erect-patent, 4 to 6 inches long, nodding at the top, bracted with small white-margined leaves; perianth, 2½ to 3 inches long, dull yellow; segments, deeply revolute, 9 to 12 lines broad, with a few small reddish dots near the base, slightly lamellate-papillose; groove, deep, with smooth edges; filaments, half the length of the perianth; anthers, 5 or 6 lines long; pollen, red; ovary, 6 to 8 lines long, about half the length of the curved style. A garden variety, probably a hybrid between *L. candidum* and *L. chalcadonicum*; flowers in the end of July.



Leichtlin Japanese Lily (*L. Leichtlinii*).

39. *L. Leichtlinii*.—Hook., fil., Bot. Mag., t. 5,673; Ill. Hort., t. 540; Flore des Serres, t. 1,736; Belg. Hort., t. 11; Floral Mag., t. 509.—Bulb, small, perennial, globose; scales, few, broad, acute, thick, closely imbricated; stem, 2 or 3 feet high,

of a dark brown colour, slender, faintly covered with down, creeping at the base; leaves, thirty or forty in number, scattered, linear, ascending, of a deep green colour, firm, flat, distinctly three-nerved, the lower ones 3 to 5 inches long, 3 or 4 lines broad, the upper ones lance-shaped and distant from the flowers; flowers, few, in a loose corymb; pedicels, erect-patent, 3 or 4 inches long, nodding at the top; perianth, scentless, 2½ to 3 inches long, of a brilliant lemon colour tinged with purple on the outside, and sprinkled from the base to above the middle on the inside with conspicuous claret-coloured dots; segments, lance-shaped, 6 to 9 lines broad in the middle, deeply



Nodding Red Lily (*L. carniolicum*).

revolute, callous at the apex, channelled, slightly lamellated near the base; groove, deep with faintly pubescent edges; filaments, yellow, 2 to 2½ inches long, diverging widely; anthers, brownish-red, 6 or 7 lines long; ovary, slender, 9 lines long, one-third the length of the curved style. Japan, Maximowicz. It flowers in our gardens in July, at the same time as *L. tigrinum*.—Var. *majus*, Wils. in Journ. Hort., 1873, 371, with a figure, is a luxuriant form, 5 feet high, with leaves 6 or 7 inches long.—*L. Maximowiczii*, Regel, Ind. Sem., Hort. Petr., 1866, 26; Gart, 1868, 322, t. 596; Animad., 1873, 20, is a variety with brilliant scarlet flowers. Japan, Maximowicz.

40. *L. pseudo-tigrinum*.—Carrière, Revue Hort. 1867, 410, with a figure; Regel. Gart. 1868, 118; Animad, 1873, 21.—Bulb, ovoid, perennial; scales, acute, adpressed, moderately thick; stem, 3 or 4 feet high, erect at the base, covered with whitish down, of a lurid green colour, faintly spotted; leaves, scattered, linear, 4 or 5 inches long, 3 or 4 lines broad, recurved-patent, revolute at the edges, when young covered with whitish cobweb-like down on the edges and base outside; raceme, loose, containing four to six flowers; pedicels, erect-patent, 2 or 3 inches long, nodding at the top; bracts and bracteoles, linear; perianth, 2 to 2½ inches long, brilliant scarlet, with numerous dark brown dots on the inside; segments, ovate-lance-shaped, 8 to 12 lines broad above the base, very revolute, and covered with numerous lamellate papillæ; groove, deep; filaments, 2 inches long, scarlet; anthers, 6 or 7 lines long; pollen, red; style, scarlet, 1½ inches long, very much curved, twice as long as the ovary. China. It flowers in our gardens in the beginning of July.

41. *L. pomponium*.—L. Sp., 434; Bot. Mag., t. 271; Kunth, Enum. iv., 266; Reich. Ic. Germ., t. 991; Gren. Fl. France, iii., 181.



Little Turk's Cap Lily (*L. pomponium*). Flower of Little Turk's Cap Lily.

—*L. rubrum*, Lam. and DC., Gall., iii., 213.—Bulb, ovoid, perennial; scales, numerous, lance-shaped; stem, 2 or 3 feet high, thick, straight, channelled; leaves, 100 or more in number, deep green, scattered, narrowly linear, ascending, the lower ones 2 to 4 inches long, 1½ to 2 lines broad, three-nerved, with papillose and slightly revolute margins, the lowest ones 3 or 4 lines broad, the upper ones shorter and narrowly linear; peduncle, bare for 2 or 3 inches below the raceme; raceme, containing from two to fifteen flowers; pedicels, nodding at the top, often bracteolate; perianth, fragrant, 1½ to 2 inches long, usually of a vermilion-red, furnished with numerous papillæ and black dots on the inside; segments, closely revolute, oblanceolate, 3 or 4 lines broad; groove, smooth, distinctly excavated, with smooth edges; filaments, green, 12 to 14 lines long; anthers, 3 or 4 lines long; pollen, vermilion-red; ovary, 5 or 6 lines long, a little shorter than the style; capsule, ovoid, 1½ inches long, umbilicated at the top, somewhat acutely six-angled. Northern Italy and the South of France. It flowers in our gardens in the end of June.—*L. angustifolium*, Mill. Diet., No. 6, is a more slender form, with very narrow one-nerved leaves.—Var. *L. pyrenaicum*, Gouan. Ill. 25; Red. Lil. t. 145; Reich. Ic. Germ., t. 992; Kunth, Enum., iv., 262.—*L. flavum*, Lam. Gall., iii., 283. A more robust variety, with leaves a little broader and distinctly three-nerved, often extending to the base of the raceme; flowers, yellow and larger; bracts larger and style thicker. Pyrenees.—*Martagon luteum non punctatum*, Parkins, Theat., 35, is a variety which has yellow flowers without dots.

42. *L. chalcedonicum*.—Linn. Sp. Plant., 434, ex parte; Gawl. Bot. Mag., t. 993, non Jacq.—*L. rubrum byzantinum* sive *Martagon Constantinopolitanum*, Parkins., Parad., 34.—Bulb, ovoid, perennial,

yellowish; scales, numerous, lance-shaped; stem, straight, downy, 3 or 4 feet high, green tinged with purple; leaves, 100 or more in number, ascending, very close, sessile, pale green, the lowest oblanceolate, the central ones linear, 2 or 3 inches long, 2 or 3 lines broad, three to five-nerved, covered with distinct white papillæ on the edges and on the veins of the lower part inside, upper leaves smaller and pressed close to the peduncle; raceme, few-flowered; pedicels, nodding at the top, often bracteolate; perianth, scentless, 1½ to 2 inches long, usually of a brilliant vermilion-red without dots (but sometimes having a few minute dots on the inside), seldom yellow; segments,



Scarlet Turk's Cap Lily (*L. chalcedonicum*).

ob lanceolate, closely revolute, 5 or 6 lines broad in the middle, with numerous papillæ; groove, distinctly sunk, with smooth edges; filaments, 12 to 14 lines long; anthers, 4 to 4½ lines long; pollen, vermilion-red; ovary, 5 or 6 lines long, about the same length as, or a little shorter than, the style; capsule, obtuse-angled. Greece and the Ionian Islands. It flowers in our gardens in the end of July and beginning of August among the late-blooming kinds.—*L. albanicum*, Griseb. Fl. Rumel., ii., 385; Schur. Transyl., 662.—*L. pyrenaicum*, Baumg. Transyl., 632, non Gouan, from the mountains of Albania and Transylvania, is a variety found in the mountain woods with yellow and usually solitary

flowers.—*L. gracile*, Ebel, Zwölf Tage auf Montenegro, 8, t. 1, from the mountains of Montenegro (flower not described) is a variety which I have not seen.

43. *L. callosum*.—Sieb. et Zucc., Fl. Jap., ix., 86, t. 41; Kunth, Enum., iv., 262; Miquel, Ann. Mus. Lug. Bat., iii., 156.—*L. pomponium*, Thunb., Fl. Jap., 134, non Linn.—Bulb, small, perennial; scales, few, lance-shaped; stem, 1½ to 3 feet high, slender, terete, smooth; leaves, thirty to forty in number, scattered, linear, ascending, smooth, firm, green, three to five-nerved, with narrowly revolute margins; lower leaves, 3 or 4 inches long, 1 to 2 lines broad in the middle, the upper ones becoming gradually smaller; raceme, narrow, lax, containing from two to twelve flowers; pedicels, short, nodding; bracts, in pairs, ligulate, thick, 4 to 9 lines long, obtuse at the apex, and callous; perianth, always of a brilliant scarlet, 12 to 18 lines long; segments, oblanceolate, spatulate, 2½ to 3 lines broad, hooded at the tip, and without dots of any kind on the inner surface; groove, smooth, deep, and with smooth edges; filaments, one-third shorter than the perianth; anthers, scarlet, 3 or 4 lines long; ovary, 5 or 6 lines long, of equal length with the club-shaped, slightly curved style; capsule, obovoid, 15 to 18 lines long, obtuse-angled. Japan and the Loo-choo Islands, Maximowicz, Oldham, 872; Buerger, &c.



Graceful Japanese Lily (*L. callosum*).

smooth; leaves, forty to fifty in number, very narrow, scattered, ascending, the central ones 1½ to 2 feet long and ½ to 1 line broad, one-nerved, and with revolute margins; peduncle, bare for 2 or 3 inches below the raceme; raceme, loose, containing from one to twenty flowers; pedicels, 2 or 3 inches long, nodding at the top; bracts, linear-subulate, in pairs; perianth, 15 to 18 lines long, of a bright pale crimson colour; segments, oblanceolate, 3 or 4 lines broad in the middle, very revolute, usually of one colour, rarely marked with a few small blackish dots; groove, smooth, distinctly sunk; filaments, pale red, 8 or 9 lines long; anthers, twice as long; pollen, scarlet; ovary, 4 to 4½ lines long,

44. *L. tenuifolium*.—Fisch.,

Ind. Sem. Hort. Gorenk., 1812, 8;

Schultes, fil., Syst. Veg., vii.,

409; Kunth, Enum., iv., 263.—

L. punilum, D. C. in Red. Lil.,

t. 378; Kunth, Enum., iv., 263.

—*L. linifolium*, Hornem, Hort.

Hafn., i., 326.—*L. puniceum*,

Sieb. and De Vriese, Ann. Hort.

Pays-Bas, 1861, 23.—Bulb, small,

globose, annual (?); scales, nu-

merous, lance-shaped; stem, 1 to

2 feet high, very slender, terete,

terete,

one-third shorter than the slender style. Siberia, from the Altai Mountains to Amoor-land and Northern China. Pallas, Maximowicz, &c.—Var. *L. stenophyllum*, Baker.—*L. pumilum*, hort. Leichtlin, non DC.—Bulb, more ovoid; scales, fewer and broader; stem, stouter and taller; leaves, distant from each other, $1\frac{1}{2}$ to 2 lines broad, three-nerved; perianth, 18 to 21 lines long; tube, longer and more cylindrical than in the type; segments, narrow and more ligulate. Eastern Siberia, hort. Leichtlin.

Doubtful Species.

45. *L. nanum*.—Klotsch., Reise Wald., 53.—Six inches high, "downy, as far as the base of the leaves, one-flowered; leaves, linear, Grass-like, bluntish, straight, erect, five-nerved; flower, nodding, small, bell-shaped, white; perigonous leaflets, oblong, obtuse, all sessile; stigma, thickened, three-angled, downy; filaments, subulate; anthers, oblong, obtuse, bluntly bifid at the base." Western Himalayas, Hoffmeister.



Slender-leaved Lily (*L. tenuifolium*).

46. *L. lancifolium*.—Thunb. Linn. Trans. ii., 333; Mem. Acad. Petrop. iii., 202, t. 3; Kunth. Enum. iv., 266.—*L. bulbiferum*, Thunb. Jap., 134.—Habit and leaves similar to those of *L. elegans*. Stem, angular, hairy, erect, simple, a foot high or more; leaves, scattered, somewhat distant from each other, ascending, the lower ones linear, and gradually acuminate, 3 or 4 inches long, 5 or 6 lines broad below the middle; the upper ones lance-shaped, becoming gradually shorter, and bearing bulbils in the axils; flowers erect, two in number in the only specimen yet received; pedicels very short, bracted with small ovate leaves. "Corollas" (I doubt whether they were fully developed), "small, unguicular, white." Japan, Thunberg. Described from Thunberg's notes and a figure of the plant kindly sent me by Professor Areschoug. It is probably an imperfectly developed form of *L. elegans*.

[The preceding has been translated for us from Mr. Baker's exhaustive paper on this subject in the "Journal of the Linnean Society."]

GOLDEN APPLES.

GRATITUDE is due to the nameless benefactor who first revealed to a thirsty and luxury-loving West the Orange of commerce; almost the only fruit of Easter Monday. Whoever this personage was, he is an instance of the truth that "the world knows nothing of its greatest men;" for he added to the dessert-tables of Europe a truly golden gift, and set on foot a business which has been justly called of late one of the curiosities of trade. We know pretty well where the Orange first came from. It was almost certainly brought from China by the Portuguese, and there is a garden in Lisbon, attached to one of the palaces, where a gnarled and venerable tree is still shown, said to be the parent stock of all the innumerable Orange orchards of our commonest sort—namely, the *Citrus sinensis*, or *Citrus nobilis*. It was in 1547 that some travelled "Portingall" brought the pips over from which grew that famous plant, and now an enormous area of Southern Europe produces China Oranges. They fill the warmer provinces of the Iberian peninsula with their vegetable gold; they shine all along the sunny nooks of the Riviera; Corsica, Sardinia, Sicily, and South Italy are gilded with them; and all along the north coast of Africa, to Egypt and the Levant, they supply an important crop. The country round Jaffa, in the Holy Land, and again at El Jeneen, in the plain of Esdraelon, is brilliant in winter with the golden globes of this once unknown and unseen fruit, and we import into England alone more than two million bushels. In fact, that which was the fabulous delicacy of the classic world, the "Golden Apples of the Hesperides"—a thing of such beauty and value as to be guarded by dragons, and kept in charge by heavenly nymphs in some hidden garden of an undiscovered Continent—has become, thanks to the Portuguese benefactor and his packet of Chinese pips, a commodity so common that our street Arabs buy at two a penny the prize which it was the eleventh labour

of Hercules to obtain. It is perhaps rather a classical coincidence that the place with which we do the greatest business in Oranges is the group of the Azores, which learned people identify with the fabled Atlantis. During last season there was shipped from St. Michael's and the adjacent islets to British fruit markets no less than 270,000 boxes of the golden fruitage, and many of our swiftest steamers are employed from the time the first crop turns from green to yellow until the last gold is on the trees in racing home with those well-known packages of thin battens which pour their shining contents out in our shops and markets. Give the Orange tree the moist and warm climate which it loves, and keep it from frosts which it cannot stand, and no plant is more bountiful in produce. As many as 20,000 good fruit have been plucked from a single stem at St. Michael's, besides the windfall and unsaleable ones. A good Orange orchard literally grows gold for its possessor. And yet the Orange-loving public knows but few of the many varieties of this popular fruit. Its favourite sort, the Sweet China, is no doubt one of the best, and perhaps it is that which is represented upon the Willow-pattern plate, with the three little men crossing the bridge to pluck the harvest, and the ship waiting to carry it. This variety grows without culture in the Flowery Land, in Nepaul also, and Malaya, and is the kind produced in the Azores. The Orange of the Riviera is a different species, also well known; and the blood-coloured sort, which used to be considered a cross between *Citrus aurantium* and the Pomegranate, is familiar enough, and comes chiefly from Malta. The Mandarin, one of the most delicate and fragrant, which derives its name from being a common present to high officers of state in China, is also freely imported to us. It is one of the finest kinds, and when quite ripe the pulp becomes completely disengaged from the perfumed rind. Then the Seville Bigarade, which makes the marmalade of our breakfast tables, and the Bergamot Orange, from which the perfumers prepare their essences, together with the Shaddock, Pomello, Pompelouses, or forbidden fruit, are all well enough known. But the amateur of Oranges seldom or never sees over here the Pear-shaped variety, or the Fingered kind, where the fruit splits into two or more divisions; or the Phillipine Orange, no bigger than a Gooseberry; or the Horned Bigarade, which has the sweetest of all blossoms; or the Female Bigarade, a most curious kind, where one perfect fruit encloses another; or, again, the Sweet Lemon, called also the Commander's Pear, which is more an Orange than anything else. And if we should pass into the kindred and almost endless kingdom of the Limes, Lemons, Shaddocks, and Citrons, it is astonishing how many varieties might be named of which the British public knows and sees nothing, though many of them would of necessity be most popular. There is no fragrance in all the vegetable world more exquisite than that which is diffused by the Fingered Citron of the Chinese; it is an enormous fruit, with the carpels separated as in the Horned Orange, and genteeler Celestials place it upon a porcelain dish in their apartments, or at their banquets, to delight the nose, for the flavour of the pulp is not very remarkable. Then, if we could only grow the Persian Citron to its proper size in our hothouses, the public would both see one of the loveliest trees in creation, and taste one of the finest sherbets. This plant has rosy, not white, blossoms upon its dark glossy green branches, and is always full at the same time of buds, flowers, and of fruit forming, formed, and ripe. There is no reason why many of these unknown kinds should not be brought over here, except that trade, with all its supposed vivacity and enterprise, is wonderfully conservative. What is liked in the market suffices for shippers; they follow each other like sheep on a path, and lose their money too often in rivalling competitors; while, if they did but introduce a new article, they would start fresh lines of commerce and make fortunes. If the wonderful figures of our British fruit trade could be cited, it would be quickly seen what a mine of wealth may be opened by those who create a new taste in this way among the community. And, while on this subject of the conservatism of the trade in Oranges and Lemons, it cannot be irrelevant to marvel at the abject want of inventiveness and enterprise shown by our merchants as regards new fruits of other tropical sorts. Beyond a feeble experiment now and then with Pomegranates and with the Banana—which is generally either green or rotten—and some of the coarser Nuts, such as monkeys only eat abroad, Covent Garden strikes out no new line. Yet it has comparatively close at hand, in the West Indies, one of the richest fruit-orchards of the globe, overflowing with delicious and wonderful productions which would take the taste of the public by storm. There is the Mango, for instance, which in its perfection, but for a slight flavour of turpentine, would be a fruit almost too dainty for mortal lips; there is the Anona, a ready-made custard, sweetened and perfumed to hand by the subtle cookery of Nature; the Loquat, the Papaw, the Squash, the Avocado Pear, the Bread-fruit, the Guava, the Jack-fruit, and an almost endless catalogue of similar novelties, which are wasted by thousands of tons for want of a

demand. There is, above all, the Mangosteen, a fruit which unites into one divine combination the juiciness of the Alphonse Mango, the perfume of the Bergamot Pear, the sweet solidity of the Nectarine, and the subtle essence of the Pine-apple. The public benefactor who could bring Mangosteens from Malacca would give our frugivorous people an unknown delight, and accumulate profits "beyond the dream of avarice." We shall be told, of course, that the thing is impossible; but the same used to be said about importing fresh beef and mutton from the Antipodes and South America. It used to be thought equally impossible to bring Oranges from St. Michael's, till some sagacious person hit upon the idea of packing them very dry and rather short of ripeness. Apples are carried in large cargoes along with ice from the American ports to Bombay and Calcutta, and no doubt science could find some method of safely transporting the delicious fruit products of tropical gardens to British dessert tables. The problem cannot be insoluble, and, were it solved, not only would the fruit merchants find their trade expanding into greater proportions, but the food stock of these islands would be augmented, and the sunny world of the East and South would become our orchard.—"Telegraph."

ARTIFICIAL BIRDS' NESTS FOR GARDENS AND GROVES.

As in America almost every country dwelling has its martin-house, so in many parts of the Continent, and especially of Germany, no garden or orchard would be complete without one or two nesting boxes



Artificial Bird's-nest.

which may serve either as a home for the starling, or be let unfurnished to more melodious or finer-feathered birds. Occasionally an owl, or a pair of irrepressible chattering sparrows, will take possession of the residence meant for their betters; and then the serious question of eviction arises. In the case of larger grounds, parks, and woods, on the other hand—as, for example, the Bois de Boulogne near Paris, and the Berlin Zoological Gardens, where artificial nests have been distributed for several years past by the hundred thousand—the would-be tenants remain undisturbed, whatever their plumage, voice, or degree of utility. With respect to the employment of hatching-boxes, from the farmer's, forester's, and gardener's point of view, those who have resorted to them abroad are strongly in favour of their adoption in districts much subject to the ravages of grubs, beetles, caterpillars, slugs, &c.; and instances could be quoted in which they have been the means, by attracting and promoting the increase of insectivorous birds, of preserving whole plantations from permanent injury. Recognising their usefulness under the above circumstances, societies for the protection of animals in France, Germany, and Switzerland, award prizes for nests of superior construction and moderate price, and efforts are made to introduce them wherever the feathered population has been unduly diminished, and the balance thus destroyed between the protectors and enemies of vegetation. One of the first to recommend and adopt them with success in England was Waterton, the naturalist; and certainly, if half the complaints one reads of respecting the wholesale capture and slaughter of small birds in different parts of the country are well founded, these aids to bird colonisation are more needed now than even in his time. Apart from all

question of utility, however, the true lover of birds will find any trouble he may take in supplying his garden and grounds with songsters' homes amply repaid by the entertainment and pleasure he will have in observing the habits and movements of his *protégés* during their matrimonial life, and listening to their melodious voices. Concerning the shape and make of the artificial nests; they vary, of course, somewhat, with the kind of bird it is desired to attract. In parts of Switzerland, and especially in the Cantons of Vaud and Neuchâtel, the cylindrical wooden or earthenware nest, represented by fig. 1, has been distributed with very satisfactory results in gardens, plantations, &c., serving as a family mansion for the starling, titmouse, woodpecker, and other birds which build in holes and hollow trees. In



Fig. 2.

Germany, on the other hand, the hexangular varieties, indicated by figs. 2 and 3, are the ones mostly in use, and very "eligible bijou residences" can be constructed of bark, cork, Cocoa-nuts, wired Moss, and Lichen. As a rule, the opening of the nest should face the east, and in deciding on the exact position of the domicile (height from the ground, in bush or tree, &c.), as far as circumstances will allow, regard should be had to the natural habitat of the birds we wish to entice. For the benefit of anyone desirous of giving the nests a trial,

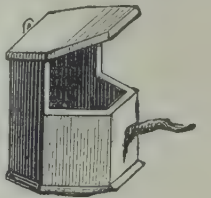


Fig. 3.

we may mention, in conclusion, that specimens of the more approved varieties may be seen at the office of the Society for the Prevention of Cruelty to Animals, 105, Jermyn Street, or purchased of Messrs. Edelsten & Co., of 17, Upper George Street, W. Some of them distributed last spring, in the environs of London, were soon inhabited by starlings, robins, flycatchers, and other birds, and the time has now arrived for a fresh set of tenants.

T. S.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Sowing Carrots, Broad Beans, Peas, &c.—Sow the general crop of these now; it is better to postpone sowing the principal supply of them until the present time, for, if they are put in sooner, a considerable portion will often run to seed, more especially in dry seasons, and where the land is light and sandy. For Carrots heavy dressings of fresh manure should be avoided, as this is liable to produce canker; ground that has been well manured for any previous crop, such as Lettuce, Cauliflowers, or Onions, is the best, and if a liberal dressing of soot be worked into the ground it will both increase the weight of the crop, and act as a preventive to disease. Carrots succeed best on land that is neither too heavy, nor too light; but deeply cultivated. An additional supply of Broad Beans and more Peas should now be sown; of the latter, if Champion of England, Veitch's Perfection, and one of the tall kinds, such as Emperor of the Marrows, or British Queen, are all put in at once, a successional crop will be obtained. Unless where the land is wet, Peas at this and subsequent sowings should be sown in shallow trenches, so that the soil covering the seed should be about an inch below the surface level at each side; this will admit of the liberal application of water, which, in dry weather is necessary to them. To further assist them a quantity of manure should be worked in deeply at the bottom of the trenches. Do not sow too thickly; at this and the succeeding sowings half the quantity of seed required earlier, or when there was more to fear from the depredations of slugs and birds, will now suffice. More Spinach should be put in between the rows of Peas or any vacant spaces, and a little more Turnip seed, if required, should also be sown. Of Seakale, if a sufficient quantity of roots is not at hand for planting, seed may now be sown, making holes with a dibber, and covering it with an inch of soil; drop three or four seeds in each hole, which should be 18 inches apart in the row, with a similar space between the rows, these distances asunder being best suited to the proper development of plants of this description. More Cauliflower and Lettuce should be planted out at the present time, giving them a good open situation. The soil must be well prepared, with a liberal application of manure, without which these vegetables can never be had in perfection.

Pits and Frames.—As Cucumbers advance in growth, keep the shoots regulated, training them evenly over the surface of the bed. Pinch off any fruit that appears, until the plants have got sufficient strength to bear without checking their growth. As the roots protrude, add more soil to the hills of earth in which they were planted,

first laying it, for a day or two, up to the sides of the frame, so as to warm it before putting it up to the plants, and maintain the heat by the application of hot dung round the sides of the bed. Sow Vegetable Marrows; these will vegetate quickly in a Cucumber frame, in which they may be kept for a short time, and then gradually hardened off for planting out. The seeds should be sown singly in 48-sized pots, and moved on into larger ones as they require it. Celery plants, as soon as they are large enough to handle, must be pricked out in cold frames. This vegetable likes a rich soil in all stages of its growth, one part of rotten dung to three parts loam being suitable for it; this should be laid 4 inches thick on a bed of ashes, rammed down quite hard, so as not to allow the roots to enter it much. Place an ordinary garden frame upon this, and put in the plants 4 inches apart each way, watering the soil moderately before planting, and never afterwards allow it, during any stage of their growth, to become dry.

Lawns and Pleasure Grounds.—Take advantage of showery weather to have all the walks thoroughly weeded. Small Grasses are the worst to contend with on walks, but where they are removed before they have time to seed—and this they will do whilst very small—they can be kept under with little labour. The use of salt, either applied in a dry state or in the shape of hot brine, is often resorted to for the destruction of weeds on walks, but except in localities near where it is made, it costs more than hand-weeding, and, however applied, its effects are objectionable in causing the surface of the walks to look black and damp. Keep the walks well rolled whilst moist, and an impression can be made upon them. Weeds such as Dandelion and Plantain will now show most objectionably on the Grass, and regular and persistent use of the “spud” is the best method of eradicating them. Some do not dislike to see the common Daisy on their lawns, but nothing looks so well as the Grass alone, and, when these plants exist in numbers not too great to cope with, I advise their being cut out by the roots, for, when the crown of these is destroyed, they do not, like deep-rooted plants, push again so long as they have strength. If Daisies are found even in small numbers, and are not kept down, they quickly increase to a serious extent where a mowing machine is used, for these implements throw the flower-heads over the ground; where, even in an immature state, the seeds will vegetate. A Mossy lawn is liked by some on account of its elastic nature, but the great objection to it is that a dry spell of weather kills it, and gives it a sombre brown hue. There is no better season for destroying Moss than during the April showers; it cannot bear manure, and many kinds, such as super-phosphate, guano, &c., in small quantities, applied as surface-dressings, are recommended for destroying it, but such applications cause the Grass to grow too strong. Newly-slaked lime in a dry powdery state, mixed with an equal quantity of loam, is by far the best remedy. If a dressing of this be applied after mowing, it will destroy the Moss, and will strengthen the Grass without causing it to grow too strong. Care must be taken that the loam with which the lime is mixed is fresh, or it may contain the seeds of weeds; and thus, in removing one evil another might be substituted. Keep the Grass regularly mown. Where a machine is used, there is nothing saved in labour by letting it grow too long before it is cut, as the work is then double. Nothing is more common than to see these machines set too low, so that they cut the Grass in places right down to the very roots, giving the whole a patchy appearance; and, when dry weather comes, these close cut places are almost bare of Grass. The machine should be set so as to avoid this.

Houses. — Vineries. — There are, throughout the country, numbers of amateurs who possess a single Vinery, which in some cases is used for growing various greenhouse plants as well; and the Vines are in fair condition as regards strength, but not as regards fruiting. This often arises from the wood being insufficiently ripened, and is particularly the case in damp northern districts; this state of the wood is not noticed until the leaves begin to turn yellow in the autumn, and the season is too far advanced to remedy the evil. The result is that the following spring little is to be seen besides tendrils, or half-formed bunches that dwindle away. To avoid this, means should be taken to ensure the wood being thoroughly matured. Vines that have been allowed to come on of their own accord will now be breaking, and, to push them on, the house should be closed early in the afternoon, whilst there is yet some hours' sun to fall upon the glass; until they have pushed leaves, the house should be allowed to get moderately warm before air is given in the morning. After they are in leaf, of course, air must be given before the sun has much power on the glass, or scorched leaves will be the result; but all through the season this early closing should be attended to, shutting off the air as soon as the thermometer, properly screened from the direct action of the sun, gets down to 75°, or even to 80° in very hot weather. After so closing the thermometer will often run up to 90°, or considerably more, but no harm need be feared—it will not only

ensure a ripe fruitful condition of the wood for the ensuing year, but benefit the present crop. Even after the fruit begins to colour I should recommend this early closing, giving a little air later on in the evening. Syringe the Vines as the shoots are pushing every afternoon.

TREES AND SHRUBS.

REMARKABLE LIME TREES.

THE common Lime or Linden (*Tilia europæa*) is one of the handsomest and most valuable of our ornamental trees, and its elegant form, luxuriant foliage, and sweet blossoms, render it a conspicuous and attractive object in our parks and pleasure grounds. It has a tall, erect, and rounded trunk, from 50 to 60 feet high, and from 3 to 4 feet in diameter, and the strong erect branches, numerous drooping shoots, and pliant twigs, form a handsome and symmetrical crown. The roots spread for 15 or 20 feet round the tree, and the tap-root penetrates into the ground for 4 or 5 feet. The bark is ash-grey in colour, tough, and smooth, but upon old trees it is sometimes deeply rent and furrowed; the leaves are pale green in colour and somewhat darker upon the upper surface than upon the under; the blossoms, which are hermaphrodite, spring from the upper surface of a bract or leaf-like appendage attached to the peduncle. The leaves appear in May, and the blossoms in June and July; the fruits consist of small, hard, obovate capsules, which ripen towards the end of October and fall off during the early part of winter. Each capsule contains five cells, in each of which is a small brownish seed. The Lime seems to be indigenous to Central Europe, whence it was introduced into this country towards the middle of the sixteenth century. It thrives best in a fresh, rich, black surface soil, with a sub-soil of heavy loam and chalk. If its seeds be sown in November or December young seedlings from them will appear early in the following spring. Besides the common Lime there are several other species, which are chiefly indigenous to the New World. Amongst the best-known European varieties may be mentioned *Tilia grandifolia* and *T. parvifolia*, distinguished principally by the size of their leaves and blossoms. The average age of the Lime is from 600 to 800 years. Its timber is of great value, as it neither warps nor shrinks; it possesses great smoothness and pliancy, and takes a beautiful polish. The beautiful carvings at Windsor Castle, as well as at Trinity College, Cambridge, are made from the wood of the Lime, and the charcoal obtained from it is extensively used in the manufacture of gunpowder; of its inner bark mats are made. In Russia the bark of old Limes is used in roofing houses, and baskets and hampers are prepared from the finer fibres. It is well adapted for hedgerows, as it grows quickly, has a thick foliage, and bears pruning better than almost any other tree. There are several fine Lime trees in various parts of Europe, and especially in Germany. One of the most remarkable of these grows at Neuenstadt, in Würtemberg. The height of this tree is 65 feet, and the circumference of the crown is 96 feet; the trunk, which is 13 feet in diameter at the base, divides—at a height of 8 feet from the ground—into nine huge branches, of which seven are horizontal and two perpendicular. The colossal horizontal branches are supported by 111 pillars; several Gooseberry bushes grow in its crown. The age of this tree is between 800 and 900 years. In 1476 a Lime was planted at Freiburg, in Switzerland, to commemorate the victory of the Swiss at Murten; in 1831 this tree measured 13 feet 9 inches in circumference. In a village near Freiburg there is a Lime tree which was celebrated in 1476 for its great size; in 1831 it measured 36 feet in circumference at a height of 4 feet from the ground; the age of this tree is probably 1,200 years. The annual increase of the diameter of the Lime tree is from $1\frac{3}{4}$ to 2 lines, when the tree is under 300 years old; but, after that age, the average increase is one-third of a line per annum. At Süderheistadt, in Ditmarsh, there is a very old Lime tree, whose colossal branches are bare and leafless, and regarding any buds or leaves since that country was subdued by the Danes. The Germans have long been accustomed to plant Lime trees in the immediate vicinity of their houses, churches, market places, and villages. The Lime tree occasionally

suffers much from the ravages of insects, of which a species of Coccus is one of the worst; it often covers the branches in thousands, and destroys the finest and strongest trees. A species of hawk moth may also be observed early in the summer mornings, or late in the evenings, flitting about Lime trees, and thrusting its proboscis into the flowers; it lays its eggs in July upon the upper leaves, and the young caterpillars appear in fourteen days afterwards, and feed upon the leaves during summer and autumn. It passes the winter in a hole in the earth, and appears in the following May as a perfect moth.

JOHN HUTCHINSON, M.A.

Yew Poisoning.—It is, I believe, a well-known fact, that the virulence of withered Yew branches is far greater than that of the fresh foliage. I recollect seeing some horses that were unfortunately left near a few old lopped off Yew branches, suddenly stagger, drop, and die, three hours after they had eaten the loppings; and I also remember hearing at the time a gentleman, who had lost a valuable carriage-horse through its eating Yew leaves, say the symptoms were not nearly so rapid in his case, and that the surgeon thought that if he had known the cause of the horse's illness when called in, he might probably have saved it. The poison of the Yew tree is said to reside in the leaves, bark, and seeds. The red covering of the fruit is not considered to be injurious; birds feed on its fruit, starlings especially, but I fancy they do not swallow the seeds; or, if they do swallow the entire drupe, the seeds are not broken. I used to notice last season, that birds regularly feasted on the berries of a fine Yew tree, in Liss Churchyard.—HELEN G. WATNEY.

Ivy on Evergreen Trees.—It is an ungrateful task to find fault with any communication from one who provides so much interesting and valuable matter in your columns as Mr. McNab; but in his article upon Ivy (p. 262) there is a statement which must have crept in inadvertently. He says that he cannot call to recollection any instance of Ivy growing on healthy evergreen trees and shrubs (except the Yew), or on any of the Pine tribe. My experience in the moist climate of the west coast, where Ivy is specially luxuriant, proves that this plant is as common upon evergreens as upon other trees; Scotch Fir, Spruce, and Holly, appear as congenial to it as deciduous trees, and it requires constant watchfulness and work to keep it down. I only know of one tree with which it seems unable to cope, and that is the Beech. It grows upon it, but never attains such hurtful proportions as on other trees; moreover, the strong bark of the Beech is proof against the damage which it works on trees with rougher and softer coverings. There is a very beautiful variety of Ivy, with cordate leaves, which has a peculiarly rich effect on walls; I do not know the name under which it is sold, but it resembles no other kind, and cannot be mistaken, from the peculiar shape, large size, and thick substance of its foliage.—SALMONICEPS.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Scale on Ash Trees.—The bark of many of our Ash trees is covered with scale. Is it injurious to the trees, and will it spread?—D. M. [The Ash tree scale sent is *Chionaspis Fraxini*. In many parts of England and Scotland it is very common, and when it attacks a tree it seems to increase in such prodigious numbers as to be beyond all means of human remedy.—A. M.]

Variegated Laurel.—I have recently seen growing at Highfield, on the estate of the Duke of Wellington at Strathfieldsaye, a very true and handsomely variegated form of the common Laurel. The leaves are splashed and mottled creamy-white, with not a single green one amongst them. It has been in the possession of Mr. Davidson, the bailiff, for some years, and he has found it to be perfectly true to character. Good plants of it intermixed with those of the green-leaved kind would be very effective, and as its growth is not so rampant it would, no doubt, make handsome specimen plants. I believe Mr. Davidson will shortly place the stock into the hands of some nurseryman.—A. D.

A Large Araucaria imbricata.—Passing Fawley, in Hampshire, the other day, I was struck with the appearance of a fine specimen of *Araucaria imbricata* about 60 feet high and 15 feet through. The bottom branches have been cut away to the height of 8 feet, and the others droop, so that the tree is as wide at within 10 or 12 feet of the top as at the bottom. There is a fine Juniper about the same height but nearly twice as wide growing within 15 yards of the *Araucaria*, and both look in the most robust health. There was also a good plant of a Bamboo (*B. glauca*) with canes 8 and 9 feet high. This was planted on the bank of an ornamental pond, and appeared to be quite acclimatised.—W. W., *Eaglehurst*.

Golden Spruce Fir.—I have frequently seen, in a neighbouring nursery, a variety of the Fir called the Golden Spruce. It may have been that the stock was affected in some way, or that there were yet no good specimens of it grown, but I confess the gold was not discernible to my eye. A few days since, however, whilst looking over a large number of Spruce Firs near here, I found a veritable golden Spruce—one so strongly marked with the auriferous hue as to make it stand out prominently amongst its fellows. It is also robust and healthy, and bids fair to be constant in its colour. I shall watch its development with interest.—D.

GARDENING FOR THE WEEK.

Kitchen Garden.

THE utility of drawing earth up in a ridge round the stems of vegetables is an operation which has often been called in question; but, like all other customs that have stood the test of years, it has some good points about it. Now, however, when land is so deeply drained, it becomes a question for consideration whether or not some modification of the plan would not in many places be desirable. Experience has taught me that, in light dry soils, it is best not to earth up; but, in that case, deeper planting should be practised, in order to give the plants a firm hold of the soil, without which they would not thrive. All the Cabbage family should be planted in rather deep drills or trenches, which will, in the early stages of growth, facilitate the application of water, when necessary, whilst the frequent use of the hoe amongst the plants gradually increases the amount of soil round the stems, so that ultimately the plants stand as deeply in the ground as if earthed up. I should only recommend earthing up in cold ungenial soils, or in bleak exposed situations; there is, however, no rule without an exception, and this matter must, in the main, be left to the decision of individual cultivators. If not already done, the main crop of Carrots should be sown immediately; the Scarlet Intermediate and Altringham are good kinds for this purpose. Where young small Carrots are required, a bed, in proportion to the demand, of the Early Horn may be sown every five or six weeks during the summer. Finish planting out early Cauliflowers; plant in rows 2 feet apart, in deep drills or trenches; these will now hardly require protection, and will succeed those now advancing under hand-lights and other shelters. Beet may also be sown in most places during the next week, in deep well-worked land. Large roots are not desirable; therefore, too much room should not be given—15 inches between the drills will be ample. The Pine-apple, when true, and Dell's Crimson are perhaps as good kinds as any. A good breadth of Spinach Beet may be sown at the same time; if a dry summer follows, and there is a scarcity of Spinach, properly so called, this will be found valuable. I remember that, during a season of drought, our Spinach ran out, and the man who served the kitchen was instructed to gather the fresh juicy leaves of the Beet, and take them in as Spinach. For a time all went well, and the new Spinach was appreciated; but a word was dropped inadvertently that the new Spinach was the foliage of a Beet, and not a leaf more was allowed to enter the kitchen that season, thus showing how far our prejudices may be carried. The leaves of this Beet are, however, not a bad substitute for Spinach; young leaves of Spinach Beet are, in fact, superior to the inferior Spinach usually produced in very hot parching seasons. Finish Potato planting, as well as the sowing of all main crops of other kinds of vegetables; for, if the weather continues dry, and if a dry hot summer follows, plants established early stand the best chance. Sow Chervil in small quantities once a fortnight or three weeks, and Mustard and Cress weekly, not forgetting the Curled variety of the latter. Lettuces growing in dry warm elevated positions will be better mulched before the moisture is all evaporated from the soil; this will, to some extent, save watering, and at the same time assist growth. All Lettuces should be tied up to blanch, when large enough for that purpose. Wheeler's Tom Thumb Cabbage Lettuce, although small, is very useful, owing to its quick growth and superior flavour, and it is also very hardy—quite as much so, I think, as the brown Cos. In windy exposed places, Peas should have the sticks put to them early, so that, when they throw out tendrils, they may have something to cling to on their upward course. If they once get out of the perpendicular it is very difficult to induce them to take the right course; but timely attention will prevent this.—E. HOBDAV, *Ramsey Abbey*.

Indoor Fruit Department.

Vines.—All the fermenting material which has been employed to create heat on the surface of inside Vine borders may now be cleared off, and the soil forked over. If the roots are close to the surface do not disturb them while performing this operation, but leave the surface rough, so that air and water may penetrate readily. In some instances, watering will not be necessary immediately the soil is forked over, as the dung retains the moisture; sometimes, however, it is necessary to deluge freely and frequently all parts near or under hot-water pipes and flues, to save the roots from perishing from the heat and drought which are liable to affect such places, and much of the fertilising matter which is left on the surface after the dung is taken away is washed down about the roots at the first watering. The borders in which all late Vines are growing must be well watered in time to benefit the young shoots during the early part of their growth. Borders which may not have been watered since the last crop was colouring will be excessively dry now. The first water given sometimes passes down the small fissures without

doing much good, and a second application is necessary a few days afterwards to moisten the whole properly. Vines when efficiently drained suffer more often from want of, than from excessive, watering. Up to the time the laterals cease to grow, and while the berries are swelling, little fear need be entertained of over-watering. After the fruit has set, and until it begins to ripen, a liberal dusting of the best Peruvian guano may be sprinkled over the entire surface before each watering. The damp surface-soil helps greatly to keep the atmosphere moist, but upon hot days it is necessary to sprinkle the pathways two or three times to supply the required humidity.

Pines.—Lose no opportunity of admitting plenty of fresh air about Queen fruit nearly fully swelled. Much larger and finer fruit is obtainable in this way than with confined treatment, and the aid of sun-heat is preferable to that of fire. It is not too late to shift into fruiting-pots, suckers which were not ready when the largest were potted some time back. Old plants, from which the fruit has lately been cut, may be cleared out, to give room to those newly potted, and any suckers which it may be desirable to save should be potted, and must then occupy the place vacated by those shifted into pots of the fruiting size. In all cases it is advisable to turn over and add fresh matter to the plunging material, and newly-potted plants of all kinds require more careful shading now than was needed a few weeks ago. Mats may be laid over the glass during the hottest part of a sunny day, and syringing overhead every afternoon refreshes the foliage. Queens, in particular, are exceedingly fertile in the production of suckers, and sometimes a single plant will throw up a dozen. When it is not intended to increase the stock the whole may be removed but one, and the number left should never exceed three, as it is better to make sure of a small number than run the risk of double the quantity turning out indifferently. In removing the superfluous suckers care must be taken not to injure the foliage or stem of the parent plant. When they cannot be conveniently cut or twisted from the base the point only should be taken out.—J. MUIR.

Hardy Fruit.

The season being so backward, grafting may yet be performed with perfect safety; but the sooner it is done the better. No other kind of fruit varies so much as the Pear, through climate, soil, season, and situation. Of this I never saw a more decided proof than during the past season, for, whilst the fruit of a pyramidal-trained tree of Vicar of Winkfield was quite worthless, except for stewing, the fruit of the same variety trained to a west-wall (growing precisely in the same soil, and not more than a dozen yards from the former) was of the very best quality for dessert. From this it will be seen how difficult it is to give a list of such kinds as are suited to every locality; but for the benefit of those situated as I myself am, that is upon a light sandy soil, I give the names of a dozen kinds which here, at all events, have proved to be the best of the many kinds we grow. The names are appended in the order of ripening, and the season during which they are fit for use is from the end of August to April:—Beurré de l'Assomption, Beurré d'Amanlis, Gansel's Bergamot, Beurré Superfin, Marie Louise, Doyenné du Comice, Durandean or De Tongres, Glou Morceau, Winter Nelis, Beurré Bachelier, Joséphine de Malines, and Bergamotte Esperen. This last kind is by far the best late Pear that has yet come under my observation. Of course, from such a restricted list, very many equally good varieties are excluded. If scions of any of the above kinds are at hand, lose no time in using them to replace those of doubtful quality. Peaches and Nectarines will soon be in flower, when, if the weather proves bad at the time, much care and attention will be required to ensure a successful set. Uncover at all times when the weather is genial, but let the coverings remain down altogether during cold winds or rain. Fly often makes its appearance at this stage, and should be attacked the moment it is perceived, or the consequences may prove disastrous. If taken in time, the best remedy for its destruction is Pooley's Tobacco-powder, which, if dusted thickly over the affected parts twice or thrice in the course of a week, rarely fails to make a complete clearance of the pest for the whole season. So soon as the fruit is set, disbudding must be accomplished; indeed, ought to be done thus early for two reasons; first, because the buds can be much more quickly rubbed off, and, secondly, because it is unreasonable to allow the energies of a tree to be wasted in the production of shoots that are ruthlessly torn off when 4 or 5 inches long. There need be no wonder that gumming and canker are complained of, under these circumstances; a far greater cause for astonishment would be given were trees that have been thus irrationally treated altogether free from these diseases. At this season of the year, when warm borders are in request for early Potatoes, French Beans, &c., the temptation is very strong to encroach on the rights of fruit trees, by planting these vegetables immediately over and about their roots. This practice, although sometimes unavoidable, is much to be reprobated, especially in the matter of Peaches, Nectarines, and

Apricots, as these all require a firm, indeed a hard, border, the digging of which, if well done at first, should not be attempted for years, except when root-pruning is necessary. The manner of feeding the trees I adopt and recommend, is annually to remove the loose inert top soil, using a small hand-fork for the purpose, and carefully working down to the roots; this top-soil is replaced with good maiden loam, with which is incorporated a small quantity of chalk, wood ashes, and a sprinkling of crushed bones. After this is well beaten down, the whole receives a mulching of half-rotted manure, and it is surprising with what rapidity the roots enter this new soil. It is not yet too late to give such a dressing.—W. WILDSMITH, *Heckfield*.

Flower Garden and Pleasure Grounds.

Next to early autumn the present time is the best for transplanting Hollies, Laurels, and other evergreen shrubs; some planters, indeed, prefer the present season to any other for the performance of this operation, which should be carried out as expeditiously as possible, to prevent the roots being long exposed to the sun or to the drying influence of wind. As soon as the plants to be removed have been carefully taken up, let them be at once placed in their new positions and surrounded with sufficient soil to steady them, but avoid treading it in; with the loose soil form a hollow basin around each plant, and into this basin dash several pails of water so as to wash the soil into every crevice, where it will consolidate. Soon after the water has disappeared fill in the remaining soil, and, after a day or two, this may be gently trodden down, and if the plants are likely to be effected by the action of the wind, this should be prevented, as far as possible, by the aid of stakes. After this a mulching of some suitable material should be at once applied to prevent undue evaporation from the moistened soil surrounding the roots of the plants. Showery weather should, if possible, be selected for the performance of this operation; but, should the weather be dry, a good watering overhead with the garden engine on the evenings of bright days will prove very beneficial to the plants, which, if of large size, should have the stem and principal branches bound round with Moss or hay, or soft straw bands, which should be moistened every evening until the plants become somewhat established. This will have the effect of keeping the bark in a moist and healthy condition, facilitate the flow of the sap, &c. It may now, in some instances, be found necessary to supply recently-laid turf with water to prevent it becoming burned up, should the weather continue dry. One of the principal attractions of the pleasure grounds is the beauty of a velvety lawn or greensward, and to secure a close-bottomed turf throughout the season, it is necessary at all times to keep it closely cut, and more particularly so at the present time. Broad-leaved weeds of all kinds, should any make their appearance, should be carefully extracted from it, and before commencing to mow the lawns, &c., they should be well swept, and repeatedly rolled. The latter operation is always most effectually performed soon after a considerable fall of rain. In some instances it may be found advisable to allow the scythe to precede the mowing machine, where the Grass may have been allowed to become somewhat long, and the machine is likely to fail in taking off the long flower-stems or bents. The appearance presented by Ivy-clad deciduous trees during winter is exceedingly picturesque and ornamental, although it is by no means advisable to allow this plant to cling to or to interfere with the development of valuable trees. The case, however, is different with regard to dead or decaying trees, portions of rocks, ruins, &c., which may be clothed and festooned very effectually with this ornamental evergreen plant, and, generally speaking, the more this is left to itself the better it is, but circumstances may sometimes render it desirable to reduce the dimensions or to control the development of such plants to some extent. In cases where brick or stone walls are covered with this plant it is generally desirable to keep it closely cut in, or its increasing weight is apt to force it from the wall. Now is the best time for clipping it close back. This should be done so effectually as not to leave a leaf upon it, and it is surprising to find how soon the wall will again be covered with entirely new and healthy young foliage, which will remain on throughout the season, and the litter from the fall of faded leaves during summer will be avoided. No apprehension need be entertained that the plants will be weakened or injured by this operation, as many instances can be adduced where it has been practised for many years without producing any diminution of vigour in the plants. If it be performed earlier, however, than the present time, there is some risk of the young foliage being injured by late spring frosts. Many of the variegated varieties of the Ivy are very pretty, and may be used with good effect to clothe the stumps of trees, pillars, portions of ruins, &c., if in a somewhat shady situation, or on the north side of a wall; but the plant seldom succeeds so well, nor is the foliage so fine in the full glare of the sun. Large hardy herbaceous plants, such as the various species of Phloxes, Asters, &c., are apt to throw up too many flowering shoots, and these may now be

thinned out. This will have the effect of greatly increasing the strength of the remaining shoots, and will also secure finer heads of bloom. Hardening bedding plants should now be attended to with care. Anything like exposure to cold drying currents of air should be avoided, for they are likely to dry up the tender tissues of plants which have lately been enjoying a warm and moist atmosphere. Many kinds of bedding plants will also, about this time, show a disposition to produce abundance of flowers, and this should be prevented by stopping or pinching back; as, unless the flowers are required, it is inadvisable to allow the plants to exhaust themselves by the production of flowers until they are established in the flower-beds.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Hardy Flowers, Alpine Plants, and the Wild Garden.

The proper time for sowing annuals was, some thirty years ago, a much more important consideration than it is now. Nevertheless, annuals yet have their value, though possibly they do not now stand in the foremost rank. In my young days, the border usually set apart for their culture was of considerable extent; necessarily so, seeing that the collection usually numbered two or three hundred species, containing some good, some indifferent, and many literally worthless, sorts. The predominance of the latter seriously neutralised any good effect produced by the beauty of the former, a result increased rather than diminished by the mode of sowing and culture. Each packet—it mattered not how many hundred, nay thousand, seeds it contained—was circumscribed to a limit of, say, 12 or 15 inches in diameter. Thus, in a space sufficient for three or four plants, hundreds will vegetate, and with what result? None other than the complete annihilation of the true character and development of the plant; its altitude reduced from feet to inches; its blooms, individually small, represented by units instead of hundreds. Circumstances such as these are surely more fitted to illustrate an extreme form of the battle of life among plants than such favourable cultural conditions as should assist, rather than retard, Nature in the fulfilment of her operations. Such, however, has been, and still is, the way too frequently followed in dealing with annuals. It is true, some of the more prominent among them, such as Stocks, Asters, and Marigolds, are even now deemed worthy of an individuality of growth, and a sufficiency of space, wherein to develop themselves. But there are others equally pretty whose claims have been hitherto wholly ignored. To those who will persist in sowing annuals, as I have before described, I would say pull up all, except, say, five plants, or tufts, if thinning-out to single plants be too much trouble. In the latter case, when reduced to such close quarters, they will fight the battle out among themselves, and one, or perhaps two, will represent the victors in the strife. My advice, however, is to raise annuals in shallow boxes, under shelter of a frame where tender, or quite exposed where hardy; and from these boxes the various little groups can be transferred to the border by dibbling them in; selecting, of course, a day immediately succeeding a good fall of rain for the purpose. In all herbaceous borders, it matters not how careful the management may be, blanks are sure to occur, originating from various causes, to which I need not here allude. Where bulbs, the majority of which are spring-blooming plants, have a special section of the garden allotted to their culture, an admirable opportunity presents itself for growing annuals, whereby, in addition to the spring flowers, a summer and autumn display may be secured to this otherwise naked portion of the garden. Here I would recommend sectioning the seeds out into, say, three divisions, as regards height, viz., dwarf, medium, and tall, mixing the various elements of each section together, and sowing the several mixtures now broadcast on the rough ground, having regard in respect of height to the gradation from the margin to the centre of each bed. By this means an agreeable mixture—both in colour and habit of growth—is secured, and a fair sprinkling of Mignonette adds its neutral tint. The same plan may be adopted with recently-planted shrubberies wherever there are spaces of bare earth between the shrubs. Such annuals as Collinsias, Nemophilas, Limnanthes, &c., are never seen to such advantage as, when self-sown in the autumn, they survive the winter, and burst into rich and brilliant blossom early in May. While the ground is yet cool, and the influence of the April showers has not yet disappeared, they present a brilliancy in colour, and a rich depth of green in foliage that is rarely ever attained under the scorching suns of July and August. To the list of annuals given by Mr. Grieve at page 290 let me add the fine old Love-lies-bleeding and Prince's Feather, Virginian Stock, Limnanthes Douglasii, Collinsias of all kinds, Clarkias, Eucharidiums, the charming little early-blooming Ionopsidium acaule, Convolvulus minor, Nemophilas, from the azure blue insignis to the almost black discoidalis, Leptosiphons, and the various forms and colours of Candytuft, nor are some of the double Sunflowers to be despised, as they are well adapted for the back ranks amongst shrubberies. The old Malope

and Hibiscus Trionum, Malva zebrina and crispa, the latter contributing in its crimp-edged leaves, a useful accessory towards the decoration of the dessert table.—JAS. C. NIVEN, *Botanic Garden, Hull.*

SETTING BOILERS ABOVE THE PIPES.

THOSE who have written in approval of boilers being set higher than the pipes, speak of the matter as if it were something new, which is anything but the case; for there are numbers of boilers to be found in the country set in that way. Many years ago I had one under my own care, and I have known others so placed, all of which varied considerably in the manner in which they did their work. Whilst a boiler so set is under-worked, say with not more than one-half or two-thirds of the piping attached to it that it should have, it can often be made to work properly, but it is always by the consumption of more fuel than if it were placed below its work. Moreover, where a boiler is so fixed, another and still greater evil generally arises affecting both the labour in attention and the consumption of fuel: it is this—the water in the piping of some of the houses to be heated will circulate at a reasonable temperature, whilst in others it will not move unless very hot, consequently, for these latter, it becomes necessary to keep the water much hotter than otherwise would be required—a circumstance that needs little comment as to the way in which it affects both the labour and fuel account in the course of the year. And those who risk setting a boiler in this way, where there is a number of houses to be heated by it, must not imagine that they are certain to get off with only the drawbacks just named. There are no more powerful boilers extant than the large upright tubular ones; the sole objection to them is their liability to break down, and the extravagant amount of fuel they consume. If any boiler can be made to force the water to flow in a direction in which it is not disposed to circulate, they will do it; yet I well recollect a friend of mine putting in a large boiler of this description to heat a moderate number of small houses, which only half the boiler, if properly placed, would have worked with ease. It was placed some 12 or 15 inches above its work, that is, the flow-pipe from the top dipped so much before it entered the houses, with sufficient size afterwards. It had a 4-inch expansion pipe 12 feet in height, and was set under the superintendence of a man sent down for the purpose, yet the water would not enter a single house, although every day for a week it was made so hot as to boil over the expansion pipe and to threaten to empty the apparatus. Additional air pipes were put in under the impression that there was a stoppage by air, and the pipes at the highest and most distant point from the boiler were considerably raised; but all was useless. After every other expedient had been tried without avail, the boiler was lowered 18 inches, after which no difficulty was experienced in getting it to work. Of this I was a witness, and it convinced me that there was no certainty of a boiler acting when placed above its work. Anyone who can discover a means by which the natural laws that govern the circulation of heated fluids can be reversed, may place his boiler where he likes—as high as the top of the house, if he chooses—with a prospect of its succeeding; but, until then, I hold, to have them right, boilers must be set below the flow pipe. Next to a boiler being placed high, dips and sudden rises, with corresponding depressions, such as going under and over doorways, are objectionable, and should always, if possible, be avoided, which they generally can be if sufficient forethought be exercised in planning the work; for where these exist, even when the apparatus can be made to act, it is always at an increased expenditure of fuel, in addition to which they generally interfere with the circulation often in some other house attached to the boiler. Stokeholes, with an accumulation of water in them, are certainly objectionable, but there is no reason why these should exist. Three-fourths the cost of excluding the water from such is generally expended in half measures, and often fruitlessly, whereas, if the right means were taken at first, the water could be excluded effectually at half the expense incurred. In connection with boilers in general, this winter's frost, although short, was sufficiently severe to explode many a cherished hope as to the sufficiency of numbers of boilers that have not previously been put to the test of a cold winter. I have received as many communications as would half fill a number of THE GARDEN on the subject of break-downs and inefficiency to perform the work required. If a third of the numerous disappointments experienced, and injury done during that short week's frost, were generally known, one-half of the contrivances, in the shape of boilers, would soon find their place amongst old iron.

T. BAINES.

Heat in Turfed and Unturfed Ground.—It has been ascertained (says the "Contes Rendus") that the temperature below the soil, when the surface has been stripped, in frosty weather is much lower than when it is covered with turf.

SOCIETIES AND EXHIBITIONS.

ROYAL HORTICULTURAL SOCIETY.

APRIL 7.

ON this occasion several plants of more than ordinary interest were exhibited. Messrs. Veitch & Sons furnished a collection of *Droseras*, *Sarracenias*, *Darlingtonias*, *Cephalotus*, and other curiosities, which attracted much attention; also *Dracæna Hendersonii*, a robust variety, having broad and gracefully recurved foliage, of a pale green colour, striped with rosy-carmine, dark green, and white irregular lines; *Croton tortile*, with corkscrew-like foliage of a deep glossy green, edged and mottled with crimson; *Exacum zeylanicum*, a dwarf six-blue-flowered plant, with opposite glossy green ovate cordate leaves; *Hyacinth Mount Etna*, a semi-double deep rosy kind; *Croton appendiculatum*, a kind with singular-looking deep green leaves; *Spathiphyllum Wallisii*, a white-flowered caulescent *Arad*, with lanceolate deep green foliage, and large creamy-white bowl-shaped spathes; and *Anthurium violaceum*, a creeping *Arad*, with deep green glossy leaves, and oblong clusters of purplish berries—a plant well worth a place on the back wall of a warm moist stove. The same firm also showed a new *Croton*, alluded to below. Mr. B. S. Williams furnished a well-grown collection of new and rare Ferns, Orchids, and Palms, including the elegant *Geonoma gracilis*, which promises to rival the now well known *Cocos Weddelliana* itself; also a good plant of *Martinezia erosa*, and a new Fern, of robust appearance and distinct habit, named *Pteris Williamsii*, but otherwise known in gardens as *Gymnogramma japonica*. It has five-lobed fronds, of a deep green tint, the pinnæ being finely serrulate along their margins of a deep cream colour, mottled or feathered along on each side the mid-rib with pale green. In the same collection were also *Warszewiczella discolor*, with four white-sepalled rich purple-lipped flowers; *Eurycles Cunninghamii*, a beautiful Australian bulb, with foliage like that of a *Eucharis*, but distinctly netted with dark veins, and flowers about the size and substance of a *Tuberose*, and in shape similar to those of a small *Eucharis*. Mr. W. Bull had a white variegated *Dracæna*, named *D. candida*, which is distinct, and ought to become a favourite for table decoration, also *D. insignis*, a deep bronze-purple-leaved variety, margined with crimson; a plant of the white variety of *Odontoglossum Roezlii*, which differs from the normal form in being devoid of purple markings on the petals; a strong plant of *Crinum brachynema*, bearing two tall spikes of drooping, white, bell-shaped, long-tubed flowers. Messrs. G. Paul & Sons exhibited a stand of cut Roses, among which were flowers of *Cheshunt Hybrid*, rosy-purple; *Duke of Edinburgh*, crimson; *Captain Christy*, blush; *Annie Laxton*, bright rose; and the ever-welcome *Etienne Levet*, a fine round smooth-petalled rosy-purple variety. Messrs. Paul also staged the new Hybrid Perpetual *Hyppolyte Jamain*, a large full Rose, of a rosy-lilac colour, flushed with crimson in the centre. Mr. R. Dean furnished a beautiful group of early-flowering *Forget-me-nots*, *Primroses*, and *Polyanthus*. A large potful of the violet-flowered *Aubrietia Eyreii* also came from the same exhibitor, who sent among the *Primroses* a deep crimson variety, named *Crimson Queen*. Mr. Dean also exhibited a new *Golden Spruce*, with yellowish foliage. Mr. H. Eckford, *Coleshill*, sent examples of a robust rosy-purple-flowered Chinese *Primula*, named *Emily Maria*; also flowers of white, lilac, and rosy varieties of Chinese *Primula*, and a stand of dark brownish-crimson Gold-laced *Polyanthuses*. Mr. J. Perkins, the Gardens, *Thornham Hall*, *Suffolk*, contributed a stand of the yellow *Tea Rose Maréchal Niel*, in excellent condition; and four well-grown spiral-shaped plants of *Clematis montana* came from the Society's gardens at *Chiswick*. A fine plant of *Dendrobium nobile*, about 3 feet in diameter, and profusely bloomed, came from Mr. F. Moore, gardener to Mr. W. C. Pickersgill, *Blendon Hall*, *Bexley*; it was a good specimen of skilful culture, and deservedly obtained a cultural certificate. Mr. J. Staples, gardener to Mrs. Candy, *Sevenoaks*, sent a fine plant of *Dendrobium densiflorum*, bearing twenty-eight spikes of deep golden-yellow flowers, the foliage being very fresh and healthy.

First Class Certificates were awarded to the following new or rare plants:—

Hyacinth Etna (Veitch).—This is a showy semi-double bright rosy variety, which will prove an acquisition. Its spike is well furnished with bloom, and the foliage is stout and of that bright green wax-like tint so much admired by *Hyacinth* growers for exhibition.

Croton Disraeli (Veitch).—This is a very distinct form, robust in habit and having curious halberd or javelin-shaped deep green leaves blotched and spotted with golden-yellow.

Geonoma gracilis (Williams).—This is one of the most graceful of all Palms, having elegantly recurved, slender, pinnate foliage of a bright green tint; as a decorative plant it will prove a rival to the now well-known *Cocos Weddelliana*.

Martinezia erosa (Williams).—This is another Palm belonging to the pinnate-leaved group, and resembling a *Wallichia* in general contour. Its arching, densely spinose petioles bear erosely cut or jagged pinnæ of a pale green hue, inclined to glaucous. It will form a worthy companion to the more sturdy habited *M. caryotefolia*.

Dracæna candida (Bull).—This belongs to the *D. Regina* group, but is much dwarfer in habit, and its elegant lance-shaped foliage becomes well coloured in a young state. As a stove decorative plant, or as a dinner-table ornament, this *Dracæna* cannot fail to occupy a prominent place.

Dracæna insignis (Bull).—This is similar to the last as regards dwarfness of habit and slender foliage; but the colour of the leaves is deep purple, with irregular crimson-tinted margins.

Crinum brachynema (Bull).—This is a strong-growing Indian bulb, which bears from eight to twelve drooping, white, long-tufted, bell-shaped flowers, on naked scapes from 2 to 3 feet in height. It is evidently a profuse bloomer, and is well worth culture for the sake of its snowy deliciously-fragrant flowers, which will associate well with those of the *Eucharis*.

Drosera spatulata (Veitch).—This is a pretty little rosette-shaped Sundew, with longer leaves than our native *D. rotundifolia*, and densely set with crimson or ruby-tinted viscous glands.

NOTES AND QUESTIONS—VARIOUS.

Triteleia laxa and *Murrayana* (see p. 255).—Some think that these are the same species, but that *Murrayana* is a dwarfer form than *laxa*.—J. B.

Asplenium Trichomanes incisum Claphami.—Can any of your readers tell me where this variety of *Spleenwort* can be procured?—R. N.

Macadamia ternifolia.—Is this hardy? It is said to bear a nut, but two plants of it, which for some time have been kept in a conservatory here, show no signs of fruit.—K.

Sulham Prize Celery.—I have this year grown many varieties of *Celery*, but I give the palm to *Sulham Prize*; it is not particularly large, but solid and crisp; keeps well, and is altogether a really true stock of a good variety.—R. GILBERT, *Burghley*.

Wardie Lodge Variegated Kale.—Notwithstanding the severe winter that we have had, this *Kale* has become an object of beauty in the flower garden and its leaves and sprouts look pretty used for room decoration along with *Croci*, *Narcissi*, and other spring flowers.—WILLIAM LAURIE, *Lynnwood, Alva*.

Deutzia crenata flore pleno.—This favourite plant is forced in large quantities by Mr. Hayes, of *Edmonton*, and the flowers are, and have been for some time, very beautiful. They do not, as in the open air, assume a pink tinge, but are pure white, and the pearl-like buds are as attractive as the open flowers.—R.

Viburnum macrocephalum.—The plant figured last week (see p. 287) as *Viburnum Keteleeri* is simply the wild normal form of the monstrous and better known *Viburnum macrocephalum*, a favourite in our gardens. This plant is used by the Chinese as a stock for the more admired sterile form.—GEORGE GORDON, *A.L.S.*

Daisy Destroyers.—Little grubs have attacked and destroyed nearly the whole of the foliage of my French *Daisies*. What are they, and what would be the best means of getting rid of them?—E. L. [*Julus pulchellus* is the name of the culprit—one of the smallest and most beautiful of the "snake-millipeds." It is so small that it is difficult to deal with; still something may be done to diminish its numbers by laying traps of slices of *Potato*, under which they gather, and can then be destroyed.—A.M.]

Green Double Cinerarias.—It would appear that double varieties of this plant cannot be perpetuated true from seed, and that an error of rather a serious character was made when it was asserted that such could be accomplished. The flowers produced from seeds in many cases bear no resemblance whatever to the double *Cineraria*, of which so many illustrations have been given, but are of a plethoric nature, and of a dingy green colour far from ornamental.—GEO. WESTLAND, *Witley Court, Stourport*.

Fruiting of Quercus glabra.—Allow me to inform your correspondent "K." that a noble plant of this fine-leaved *Oak* at *Bicton* produced acorns sixteen or seventeen years ago, and has annually furnished fruit ever since, in bunches or clusters of from three to eight or ten on a stalk, in the same way as common *Nuts* or *Filberts*; owing, however, to the male catkins being produced as early as the month of February, when they get injured by spring frosts and cutting winds, the acorns are not often very perfectly formed in exposed situations.—JAMES BARNES.

Sedum amplexicaule Unsuitable for Carpet-bedding.—Your correspondent "D" (p. 280) recommends *Sedum amplexicaule* as "a charming variety for carpet bedding." It is a very curious and interesting plant, and does well on rock-work, but is not at all suited for carpet bedding. In the summer the whole plant collapses, and looks just like a collection of little dried brown sticks, a state in which it remains until the occurrence of autumn rains, when it again shoots out its pale green foliage, and is a pretty plant during the winter.—H. N. ELLACOMBE, *Bitton Vicarage*.

A Small Portable Hotbed.—A gentle bottom heat, and the genial humidity which attends it, are of manifest advantage in hastening and facilitating the germination of many kinds of seeds. A large hotbed and frame are not at everyone's service when wanted for this purpose. A box with a quantity of sawdust or any other plunging material placed in the bottom of it to plunge the pots in, makes a good hotbed when set on the top of a flow-pipe in any hot-house. A large number of small pots may be got into a 2-feet square box, and the whole may be formed or shifted with the greatest ease. The mouth of the box should be covered over with a pane of glass to keep in the heat and moisture.—M.

Pruning Camellias.—The beneficial effects of pruning *Camellias* have been clearly shown here in the case of a large bush of the old double-striped variety. The first flowers on the plant were cut at the latter end of last September, and there are still a dozen or two of blooms on it that are either open or opening; its period of flowering has thus extended over six months. This is not an exceptional circumstance with this plant, for the same thing has happened year after year. The secret lies in the plant being turned out; in its being grown in sandy loamy soil; in plenty of diluted dung-water being given to it through the flowering, but not through the growing, period; and, lastly, in its being frequently pruned.—CHEVALIER.

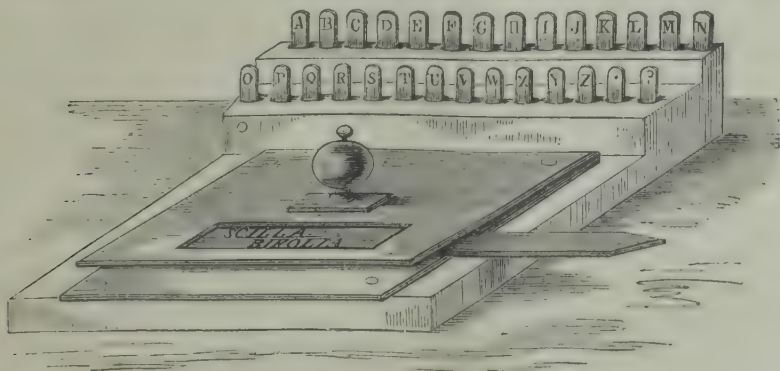
Moving Evergreen Trees.—I have occasion from time to time to move, as they encroach on each other, various ornamental trees and shrubs; and I have found great difficulty in effecting this successfully with one or two species, notably the *Hemlock Spruce* and the *Evergreen Oak*. I have now several specimens of both these trees, of from 12 to 18 feet high, which need removal; and I shall be glad to learn from those of greater experience than myself how best to deal with them, especially as regards proper season, or subsequent treatment. The trees to be moved are usually dug round some time previously to removal, and are transported on an iron plate inserted under them, so as to secure a pretty good ball. Neither *Wellingtonias* nor *Deodars* move well; but do not fail in any such degree as those which I have mentioned.—HANTS.

Vegetables in the Midland Counties.—*Broccoli* with us is scarce, the long and sharp winter having injured it considerably. We have, however, been cutting *Snow's* all winter, and to-day (April 4th) we cut some good heads of *Watt's Excelsior*. *Barr's Criterion* has stood best with us; but it is late. *Peas* never looked better. I have *Racehorse* running 9 inches high. *William the First* is decidedly the hardiest of all *Peas* here. *Standard*, another of Mr. *Laxton's* *Peas*, is also looking well, but dwarf. All were sown on the 9th of November; succession crops are coming up well, and look promising. Of *Cabbage*, we shall cut *Barr's A 1* next week, on warm south borders, where it has been netted all winter; while the *Cabbage* quarter, properly so called, is bare, occasioned by the pheasants and pigeons pecking the outside leaves off. A good hoeing has, however, made the plants start afresh. *Asparagus* is just making its appearance, and to-day I noticed a few *Potatoes* pushing above ground, while spring-sown *Spinach* and *Turnips* are all up and flourishing. With a warm shower or two, and a little sunshine, all will soon look green, fresh, and spring-like.—R. GILBERT, *Burghley*.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

STAMPED LEAD OR ZINC LABELS.

IN THE GARDEN of the 27th March, "Salmoniceps" makes some excellent remarks on the importance of using good and durable labels for marking the names of plants, and describes the form of label which he considers the most perfect. I am induced by his remarks to say a few words in favour of stamped lead or zinc labels, which appear to me to be very little known, and not half sufficiently appreciated. Every one who grows a mixed collection of plants must have often felt the annoyance of striving in vain to decipher the name of some once well known plant on a half-rotten label. The labels which I use are made of common sheet lead, which I obtain second-hand, and cut into strips, usually 6 inches long, by five-eighths wide, a size which suits well for pot plants, and also for Roses, fruit trees, and shrubs. For herbaceous plants in borders I cut them $7\frac{1}{2}$ inches long, by seven-eighths of an-inch wide. The labels are pointed at one end, and the corners bevelled off at the other. The names are stamped with ordinary steel punches, which cost about 10s. 6d. per set of twenty-six letters. The letters I use are a little over one-eighth of an-inch in height, which I consider the best size for ordinary use; but if they are required to be read at a distance they would have to be larger. When the name is punched, a little white lead paint is smeared over it, and is at once wiped off with a cloth, which leaves the letters clearly marked out in white on a lead-coloured ground; if a little chrome-yellow be mixed with the paint it gives the writing a pleasing buff colour; white does not show well on zinc. These labels are simply thrust into the soil of the pot or the border, according to their size, and are very quiet and unobtrusive in their appearance, and extremely permanent. For Roses, fruit trees, and shrubs, the label is wound round the stem or one of the branches in the form of a ring. As the branch grows the label expands with it, and after many years, when the tree has become too large the label is uncoiled and placed on another branch, and will thus outlive the tree itself. If nurserymen were once to take to the system of sending out such labels, charging a small extra price for plants so labelled, I am sure they would soon come into universal demand. I have also used labels similar in form to those figured by "Salmoniceps," viz., oval labels soldered in a slanting position on the top of a stout galvanised iron wire 2 feet long, and find them practically indestructible; but, as they require soldering or rivetting after they are punched, they are better fitted for botanical gardens than for private use. I have also used them suspended by lead wire, but the constant movement of the wind infallibly saws the label through and allows it to drop to the ground. Although I have hitherto made these labels by cutting the lead with shears, I am now having them stamped out by a lever hand-punch. I have also two alphabets, one being a small one for trivial notes and dates. Annexed is a figure of



the little machine I use for stamping; it consists of two plates of iron hinged together at the back; the bottom forms a stout bed plate, and is screwed to a board; the top plate has a slot cut in it as shown in the drawing, with bevelled edges. This slot is $4\frac{1}{2}$ inches long, and seven-sixteenths wide, and the top and bottom edges guide the punches for two-rows of letters; the front edge of the upper plate is also bevelled and serves

as a guide for broader labels. The two plates are pressed open by a spring, and the label, when inserted, is gripped by a hand-screw on the top; there are also guide-pins between the plates to adjust the label to its position. The punches are arranged at the back in two ranks, being dropped into holes, and each punch is lettered on its front face. I have punches for U S, U M, and note of interrogation. The stand is about 8 inches broad and 10 inches deep, and in my case can be screwed on the top of a tripod stand, so that the whole can be carried about the garden. The writing can be effected with great rapidity after a little practice. I have sometimes employed zinc labels instead of lead, and they seem nearly as permanent, but require a much heavier blow to imprint them. The weight of the larger label is nearly 4 oz., and of the smaller about 2 oz. The zinc ones are, of course, lighter and cheaper. "Salmoniceps" characterises the necessary qualities of a good label to be durability, legibility, unobtrusiveness, and cheapness. As regards the first three requirements, these labels defy competition. I have seen lead labels which have been nailed against a wall behind fruit trees for fifty years, and I have quantities which have been stuck in pots and lost sight of in borders for fifteen years, and in every case they appear as good as those made yesterday. At the Oxford Botanic Gardens these labels are in partial use, and the experience of them there is the same as my own. Their appearance is particularly quiet, and they are very legible, even after years of exposure. They have not the merit of cheapness in first cost, and in quantity they are inconveniently heavy to handle; but as I only advocate them for permanent plants and shrubs, and as the old material retains its original value, these to many would not be serious objections. Each label may be used twice by painting out the old name, and reversing the sides. The zinc labels are very much cheaper and lighter, and may be bought in suitable sizes ready made; but, on the whole, I prefer lead. I have myself derived the greatest satisfaction from their use, and I must venture to repeat that if nurserymen would supply such labels with trees and plants when specially ordered, they would confer a great boon on the amateur horticulturist. I believe also it would answer their purpose to sell the machines and stamps for making labels, and also the labels themselves, both in blank, and with names punched to order. While on this subject, I cannot help saying that I find it very convenient to put white or yellow paint into the collapsible metallic capsules used by artists, which I buy of Lechertier Barbe, Regent Street. A small quantity is squeezed out when making a label; and, as there is no waste, they are both convenient and economical.

LATIMER CLARK.

Hitherwood, Sydenham Hill.

FORCING EARLY GRAPES.

WE have had few sunny days here since Christmas. Our first and second Vineries were, during the third week in October, all washed with hot lime as soon as slaked. If a handful of sulphur be thrown into the lime-wash, and plenty of turpentine is mixed with the paint, this mixture will destroy all kinds of insects with which it comes in contact. Cleanliness is a matter of the first importance in forcing houses; and prevention being always better than cure, any trouble taken in thoroughly painting every crevice will not be thrown away. When the work is finished turn on the water for a day, with plenty of air, so as to thoroughly dry and harden the application before closing the house. We shut up our first and second Vineries the first week in November, syringing the Vines twice a day, and keeping the house as moist as possible till the buds show green, and then the use of the syringe may be dispensed with for the season, for the bloom always looks faded where the syringe has been used on the fruit, even if the water be as clear as crystal. The outside borders are all covered with 10 to 12 inches of litter, and wooden shutters are placed on the top to keep out rain and frost, and we never remove either the litter or the shutters till the Grapes are ripe. The inside borders are raked over and left rough on the surface, and then we put about an inch or so of fresh rotten manure on the top, which serves as a protection to the top roots. Watering will carry the manurial properties of this mulching down to the roots by degrees, and keep the surface of

the soil in a genial moist condition, besides attracting the young roots to the surface, which give colour and substance to fruit and foliage. We commence to give fire-heat about the 20th November, to the extent of 55° to 60° at night, and 5° higher in daytime, till the buds begin to swell; the night temperature is then raised to 60° , and the day temperature to 65° . This is continued till the bunches get fairly visible, when another slight increase of heat is given, till, by the time they come into bloom, the night temperature is 65° , and day 70° . We never, on any occasion, go higher than this with fire-heat alone; but we never move a ventilator from the time the houses are closed till the fruit is half coloured, and then the first mild day the front ventilators are opened a little, as often as the weather will permit, which gives motion to the inside atmosphere, whilst both the heat and moisture are retained; on the other hand, if the top ventilators were opened, the heat and moisture would escape, which would render it necessary to keep the pipes hot, and this would create a dry parching atmosphere that always checks growth and renders the leaves liable to attacks from red spider; in fact, drought in any kind of forcing should be guarded against, although extreme moisture should also be avoided. On a dull, dark day, keep the temperature low and the house quiet; but on a bright, clear day, work it up to 85° or to 90° . Treated in this way, Vines will always produce a clean expanded foliage, possessing plenty of substance with which to finish off the fruit satisfactorily. Our first house was in full bloom the first week in January, and, while they continued so, no difference was made in the temperature, excepting in the morning, when no more moisture than is absolutely necessary should be given till ten o'clock; when the canes are gently tapped, to put the pollen into motion, and then any part that requires it is moistened. A great deal, however, depends on the weather outside—if dark and dull, little moisture is required; but if bright and clear you may give a larger quantity. There is a great deal more harm done, as regards bad setting, with a dry, parched atmosphere and plenty of air, than with a moist atmosphere and no air. The dark season has affected no part of the Vine much, except the foliage, which is not so fully expanded as usual. The leaves are slightly contracted at the edges, and are wanting in substance and in that fine dark green gloss, which they have in clear weather; but, as to the fruit, I never saw the berries swell better, and so equally. The Black Hamburgs have that hammered appearance so much valued, and colour well, with a fine thin bloom on them. No red spider is to be seen, for the sun has never been hot enough this season to hatch them. We commenced cutting Grapes on the 25th March. We could have cut some of White Frontignan and Foster's Seedling a week earlier had I chosen. On April 6th I had almost finished cutting the first Vinery, and have cut two boxes out of the second from the hot end. The first and second Vineries are 50 feet long and 20 feet wide, and contain chiefly Black Hamburgs. The third Vinery is 56 feet long, and contains nothing but the latter variety; and in the hottest part of this house the berries are just beginning to change colour, so that they will be ready for cutting as soon as the second house is finished. The fourth Vinery is 50 feet by 20—all Muscats, which will be ready for cutting the first week in May. This is the sixth season we have forced these four Vineries thus early, and our fruit has never been superior either in quantity or quality. With respect to the best white Grape for early forcing, I find Foster's Seedling a free bearer, good setter, having large bunches, and good-sized berries. It possesses a very agreeable flavour, and is grafted on Buckland Sweetwater, which cannot be depended on as an early forcer. In black Grapes, the Black Hamburg still keeps the lead, but it is almost equalled by the Madresfield Court, which excels it in flavour. I cut the shoulder of a bunch the other day, the berries of which were as black as a Sloe, with a fine bloom. The flavour was excellent, but a few more days were required to thoroughly ripen the fruit. It is grafted on the Hamburg. As a second early and summer Grape, the Madresfield Court will become a great favourite; for a late Grape, it must be in a very dry house, for if there be any damp it is at once spoilt. JAMES SMITH.

Waterdale, St. Helens.

NOTES OF THE WEEK.

— WE desire to call attention to the note (p. 334) on the excellent samples of Seakale gathered from wild plants on the Hampshire coast, and sent us by a correspondent there. We think his suggestion that the plant should be grown everywhere by the sea-coast an admirable one. When cooked, it proved to be the most delicately-flavoured sample of Seakale we ever tasted. It is almost needless to add that the plant will grow anywhere on our sea-coasts, and that, by utilising waste ground there, large supplies of a most delicate and wholesome vegetable could be raised.

— CUT FLOWERS of the newly introduced bulbous plant, *Freesia Leichtliniana*, have just been sent to us by the Colchester Bulb Company. It has pale sulphur-coloured Auricula-scented flowers, which are borne on stout spikes 6 or 8 inches high, and in shape and substance closely resemble those of the Tuberose. Independent of its beauty, which is by no means inconsiderable, its scent alone must make it a favourite.

— THE Governor of the Bahamas reports that the cultivation of the Pine-apple is rapidly spreading through those islands. On one estate, in the eastern district of New Providence, from one spot could be seen at a glance 1,200,000 Pine-apples growing. They were well cultivated and in good order; and such a broad expanse of young fruit, set amongst sharp and distinct-looking leaves, gave a peculiar feature to the landscape. Pine-apples to the value of £55,497 were shipped from the Bahamas in 1873 to the United States and England.

— IT has been determined, by the Southampton Town Council, that all the trees and shrubs growing in the public parks there should have their botanical names attached to them. This may be an excellent intention, but its value depends greatly on the way in which the work is carried out. The labels should be something less in size than an ordinary tombstone, and of a durable material. There should be legibly printed on each the common name of the tree or shrub to which it is attached, as well as its botanical name; and if its native habitat could be added, so much the better.

— THE Acclimatisation Gardens in the Bois de Boulogne, Paris, have received a rare collection of artificially coloured plants from China. The plants are exhibited in the great glass house of the gardens, and excite universal admiration. Among the collection is a dwarf tree of half a metre in height, the trunk of which is as thick as the finger, and the root of which hardly fills the hollow of a man's hand; the specimen is about 100 years old, and is a species of Oak. This, however, is not a natural phenomenon, but the result of Chinese horticulture, which finds its highest problem in the reduction of the natural size of plants.

— IN Silesia, says "Nature," a new glass was invented a few days ago, by Herren Lubish and Reiderer, in Count Solm's glass-works, Andreashütte, at Klitschdorf, near Bunzlau. This glass, which the inventors call "metal glass," is so hard, that when a pane lies on the ground and a leaden ball of 40 grammes weight falls upon it from an elevation of 12 feet, it receives not the slightest impression; nor is it in the least affected when dipped whilst red-hot into cold water. Window panes, lamp cylinders, and other articles made from this metal glass, can therefore almost be denoted as unbreakable.

— IN Belgrave Square may now be seen a large hanging basket, simply but effectively planted with *Aucuba* and the common Ivy. The basket is a large one, fully a yard in diameter, and holds a good body of soil. A bushy *Aucuba* occupies its centre, and the Ivy forms an elegant fringe, hanging in graceful drapery fully a yard below the basket. Large baskets of this description ought to be more generally seen wherever there is room for them; and, if they are of a good size, they give but little more trouble in watering than an ordinary window box. During summer, a scarlet *Geranium* or two might be added for colour, and Crocuses, Snowdrops, Daisies, and other early-blooming plants might be employed for a similar purpose in spring.

— AFTER the long and hard winter, now, it is to be hoped, passing away, the following beautiful flowers are stated by a correspondent to be the brightest which he now has in a good collection of hardy plants, viz.:—*Saxifraga virginensis*—This little gem has pure white flowers, borne in dense clusters, and its yellow-powdered stamens give it an appearance which may not unaptly be likened to miniature Apples of gold in baskets of silver. *S. oppositifolia pallida*—This is of dwarf cushion-like habit, its soft rosy-mauve flowers being larger than in the typical species, or its white-flowered form. *S. Burseriana*—This is of upright tufted habit, its white Cardamine-like flowers being borne on rosy-carmine-tinted flower-stems, which rise about an inch above the fresh green tufts. *Soldanella montana*—This bears fresh green foliage, nearly circular in outline, or disc-shaped, and its pale purple or mauve bell-shaped elegantly-fringed flowers are borne on a nodding *Scilla*-like scape. It is a plant well worth growing.

THE INDOOR GARDEN.

ALLAMANDAS AS CONSERVATORY PLANTS.

WE find the Allamanda one of the most valuable plants that can be grown for the decoration of the conservatory in summer, there being so few flowers possessing such a bright yellow colour that can be employed for that purpose. Its long trumpet-shaped flowers, in trusses of fours and sixes, with which a few well-grown plants are studded, produce a brilliant effect where shades of red in flower and foliage are predominant; the individual flowers also last much longer in the conservatory than in the stove in summer. It is one of those robust-growing, easily-managed stove plants that do well for decoration after being grown up to the flowering point in heat. If kept out of draughts in the conservatory it will grow slowly and flower from the 1st of June to October, and the varieties best suited for this work we find to be *Hendersonii* and *nobilis*.

The former is an exceedingly free-blooming kind, showing its flowers on much shorter growth than any of the other varieties; the flowers are also larger than any excepting *nobilis*, and, being of a less scandent habit, it can be more easily grown into a shapely plant by tying it to a few sticks round the margin of the pot. *Nobilis* is a more robust grower; and, unlike the other, which is smooth in all its parts, both its wood and foliage are covered with fine hairs; the flowers are a paler yellow, but very much larger than those of *Hendersonii*. It is, in every respect, a noble flower. Cuttings of all the Allamandas are as easily struck in a propagating-pit, and on a bottom-heat of 80°, as *Fuchsias* are; in a common dung frame under bell-glasses they will root in twelve days. Cuttings should be made of short-jointed half-ripened wood, and inserted singly in thumb-pots, so that they can be safely shifted on without injuring the young roots. The points of the newly-struck cuttings should be pinched out, and, after further growth to two or three joints have been made, the points should again be pinched out and the shoots tied outwards to sticks, thus laying the foundation for a future plant of good shape; when this has been accomplished the plants may be allowed to grow on and flower. Suppose

the young plants to be grown on in heat—in a close moist pit in which the pots are plunged in leaves or tan—attention must be paid to shifting on as the pots become filled with roots. A very fibrous, yellow, sandy loam, with a mixture of rotten horse dung, suits them admirably. The Allamanda is a gross feeder and strong rooter, and, therefore, the usual mixture of peat is not necessary. It is in the second and succeeding years of the life of this plant that we find it most useful for the conservatory. If autumn or spring-struck plants have been grown on the first season they will be good specimens in 10-inch pots by October, and will begin to ripen off. We winter them in a pit, where a temperature of 50° can be maintained throughout the dull months, the pots being plunged in old tan or leaves, just deep enough to cover them, a little moisture about the roots being supplied. Under this treatment the plants gradually lose their leaves, and they require no water whatever at the roots until the time comes round for

starting them again, for which the middle of March, or even later, will be sufficiently early. They should then be pruned back like Vines, cleaned, if necessary; then subjected to an increase of temperature, and syringed. When it is seen that the plants are just moving into growth, they should be re-potted, as much of the old soil as can be removed, without destroying the roots, being picked away; they should then be returned to the same pots, and be grown on in a light house or pit. By the end of April they may require a shift into pots a size larger. Most of our plants have been grown in the same pots for three years in succession, and flower very satisfactorily; they are, however, indulged with a regular supply of weak liquid manure. About the second week of June they are sent to the conservatory, where they occupy elevated positions, that is, they stand up in the warm atmosphere of the house, away from cold draughts, and here they flower up to the second week of October. Both species mentioned receive the same treatment; the others, such as *cathartica*, *grandiflora*, or *Schottii*, are not so well

adapted for conservatory work. For stove rafters the Allamanda is a grand plant, not only on account of its growing and flowering habit, but also because it remains unmolested by insects, and, therefore, the plants grown underneath are not disturbed or injured during any cleansing process, as sometimes happens in the case of kinds more liable to be infested by these pests. W. D. C.



Large-spathed Flamingo Plant (*Anthurium Scherzerianum*).

THE FLAMINGO PLANT.

(*ANTHURIUM SCHERZERIANUM*.)

AT the spring exhibition of the Royal Botanic Society, held on March 31st, Mr. Ward, gardener to F. J. Wilkins, Esq., of Leyton, exhibited a vigorous specimen of this species, bearing four remarkably large spathes. Our illustration, sketched at the time when it was exhibited, will give our readers some idea of the appearance of this large-spathed variety, which, for healthy luxuriance, we have never seen excelled. The broad flat spathes were fully 5 inches in length and 4½ inches in breadth, and attracted much attention. In colour these spathes were not so brilliant as those of some of the other varieties exhibited on that occasion; but perhaps spathes produced under more favourable circumstances, as regards weather, may be brighter. Like all other cultivated plants raised

from seed, this *Anthurium* is very variable in habit, size of spathe, and brilliancy of colouring; and this variety is now further augmented by the introduction of a whitish-spathed kind, which we hope will prove a charming companion to the crimson or orange-scarlet-spathed varieties. B.

GOLD-LACED AND OTHER POLYANTHUSES.

I SHOULD infer, from the many enquiries I am constantly receiving, that the old Gold-laced Polyanthus is again likely to become popular with many lovers of flowers. Scarcely a week passes during the winter, but some one is found asking where such fine old sorts as Sanders' Cheshire Favourite, Hufton's Earl of Lincoln, Cronshaw's Exile, and Buck's George the Fourth can be obtained. These and eight or nine others were much grown from twenty-five to thirty years ago, and I had feared some of them had entirely gone out of cultivation; indeed a few of them may have quite died out. Of our

best known present Polyanthus cultivators, I can instance the veteran John Read, of Market Rasen; William Alsebrook, Sheffield; and the Rev. F. D. Horner, Kirkby Malzeard—who is, floriculturally speaking, “the worthy son of a worthy sire.” A visit to either of these gentlemen at this season of the year, would prove a treat to any lover of this fine old florists’ flower. To do full justice to the exquisite beauty of the Gold-laced Polyanthus, the plant must be grown in pots. Polyanthuses in the open air thrive but poorly when the cold winds of March sweep across our gardens, and shrivel up the delicate blossoms of our early spring flowers. The Polyanthus should be in a cold frame, near the glass, where the plants can have plenty of light and air, to keep them from becoming drawn. Top-dressing is done now. The reason for this is at once seen by anyone conversant with the habit or growth of the Polyanthus. At this time of the year, the spring growths are being matured, and these growths spring from near the collar of the plant, and they throw out rootlets near the surface. These rootlets should have something good to root into, for the plants derive a great deal of sustenance through them; hence the practice of top-dressing. The florists who grow this flower for show, use thoroughly rotten horse and cow-dung, and maiden loam, in about equal proportions. No cold winds or frost are allowed to come near the flowers, as they are likely to do injury to them. The direct influence of the sun must also be guarded against, as hot sunshine will mar the beauty of the blossoms. There are yet many who, for want of accommodation, grow the Polyanthus in the open ground, and that most successfully. The bed is carefully prepared in the autumn, by digging it deeply, and manuring well with thoroughly rotten cow or horse-dung and plenty of leaf-soil, and by the beginning of November, the plants are planted out. The Polyanthus will stand a great deal of moisture at the root during winter, provided there be a free circulation of air; and it is always well, when severe wintry weather threatens, to shake some Fern or other loose litter over the plants, to screen them from injury. By the middle of March a movement of growth will take place, and the flower-spikes will begin to show themselves. The soil should be stirred about the plants to the depth of 1 inch, taking care to avoid doing injury to the roots by disturbing them, and the bed should be top-dressed with a compost like that recommended for plants in pots. When this is done, some shelter should be extemporised from cutting winds. One of the best means of obtaining this shelter is to cut some branches of the Spruce Fir into small pieces, and stick them about the beds to windward of the plants, and in this way an excellent screen is obtained. During the last two or three years a fine strain of decorative Polyanthuses has been obtained, and designated as a fancy or mottled section. The plants are all of vigorous growth, and they throw up bold trusses of flowers on strong foot-stalks, the blossoms being of great size and beautifully marked. From pure white, through yellow, pale lilac, rose, bright purple, magenta, and crimson, these Fancy Polyanthuses vary in colour, and having plenty of robustness of constitution, they are invaluable for beds in early spring, for mixed borders, and for cultivation in pots. A good soil is required, and the more attention they receive the more beautiful are their flowers. Last year, the Royal Horticultural Society certificated two or three types, so finely were they shown at some of their meetings—a measure of encouragement they well deserve. These few seasonable notes would be incomplete without mention of the new single Primroses that have been raised and exhibited of late. The yellow Primrose of our hedges and woods has developed into a flower of great perfection and beauty by means of careful fertilisation. White and yellow, lilac and purple, rose and red, magenta, scarlet and crimson, and even blue shades, have been obtained. Such varieties as Violet Gem, Auriculæflora, Rosy Morn, Sunrise, Violacea, Lilacina, Splendour, Fairy Queen, and Sulphurata, may be mentioned as worthy representatives. All the qualities most dearly prized by the florist—form, outline, substance, brilliancy of hue, &c.—are here present, and, in addition, they flower early, profusely, and continuously. They are remarkably fine when cultivated in pots, after the fashion of the Polyanthus; but they do not require any nursing, for they are as hardy and robust in character as the common Primrose of the roadside.—R. DEAN, *Ealing*, in “Florist.”

NOTES ON CAMELLIAS.

FIMBRIATA Improved is a very beautiful Camellia, compared with which the ordinary fimbriata is smaller in the foliage, but larger and fuller in the flower. There is also an Oak-leaved variety of fimbriata which does not appear to be of any great value. Jenny Lind is a fine variety in colour—white spotted with pink; it is neat in shape, but is rather a shy flowerer. In the same class as the latter is Countess of Orkney, a beautiful creamy-white with some delicately marked red petals in the flower. This plant has rather a straggling habit of

growth. Cup of Beauty, a kind similar to the last-named, is a fine sort, though the plant when in fair health sometimes has a sickly appearance. La Reine is one of the most beautiful, and it would be difficult to adequately describe the fine marking of some of the flowers. Comte de Paris is also very pretty for variety, being white, tinged and striped with pink. Amongst reds, imbricata, like the old alba plena amongst whites, is almost too well known to need mentioning; yet it is still among the best for the conservatory. Reine des Fleurs is a most beautifully-arranged red flower, having a semi-drooping habit. Monarch is a very good sort—a strong grower and profuse bloomer, of a lively red colour, showing some stamens in the flowers. Amongst small reds is miniata, which is of very neat shape, and a very useful variety for cut flowers. Henri Favre is not unlike miniata, and is also of a valuable kind, of a somewhat larger size, with a shade of pink in its centre. Amongst large reds, Mathotiana is a noble-looking flower, measuring fully 4 inches across. Augustine superba is a delicate pink and handsome flower, but it is not a vigorous grower. Hendersoni is also a very good and neat pink. Princess Marie, a very ornamental pink, grows and blooms freely. These observations are based upon an examination of a well-established collection of plants of a fair size, which have been making a brilliant display in a large conservatory since October last.

Abney Hall, Cheadle.

ROBERT MACKELLER.

Azaleas and Camellias on bottom-heat.—Would Azaleas and Camellias be benefited by putting them in a cold brick pit with 2 feet of horse-dung and leaves under them, the plants being set on bricks above the heating material to make their growth; would the rank steam out of the dung injure the foliage; or would the plants be best put in the pit without the fermenting material?—W. T. C. J. [I should not advise the use of fermenting materials in a pit in which Azaleas and Camellias are placed to make their growth, as the vapour rising from them in the night, when the pit would require to be closed, would make the young leaves (especially in the case of the Azaleas) too soft and not able to bear the amount of sun necessary to solidify and give them, as they grow, their wonted substance. In the southern portion of the kingdom Azaleas and Camellias, except where required to flower early, will, under good management, make their growth and set their flowers without the assistance of artificial heat. The principal thing to observe is to close the house or pit, in which they are placed early in the afternoon, whilst there is yet some hours’ sun upon the glass, and not to give more air during the day than is necessary for the health of the plants and to prevent scorching. Camellias will succeed further from the glass than Azaleas, but will, of course, require more shade. Azaleas, especially whilst making their growth, cannot be placed too near the glass, and (except the small-leaved varieties, that is, those of the *Gledstanesii* and *variegata* type) are better shaded but slightly, and this only in the hottest part of the day in bright weather. Whilst the plants are growing, use plenty of moisture in the atmosphere, and syringe freely overhead when the house is closed. Azaleas, at all times, require more water at the root than the generality of hard-wooded greenhouse plants. Camellias, especially whilst growing, should have it in abundance. Keep the Azaleas free from their great enemy—thrips—otherwise it is impossible to grow them well. On the appearance of this pest, syringe them thoroughly with tobacco-water, laying them down on their sides to prevent its getting to their roots.—T. BAINES.]

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Large Spathes of Anthurium Scherzerianum.—The spathes of Mr. Ward’s plant of this (see p. 274) being considered very large, I may mention that at Sedgwick House, near Kendal, I saw the other day six spathes, the largest of which measured 6½ inches in length, and 4 inches in breadth. Mr. Bethell, the gardener, informed me that last year some of the spathes measured 7 inches in length, and nearly 5 inches in breadth.—G. S. FRIEND, *Portwilliam*.

Phajus grandifolius a Cool Conservatory Plant.—Conspicuous amongst plants that are now in bloom is the *Phajus grandifolius*. When well grown its handsome shape and stately appearance render it worthy of general cultivation for decorative purposes. It is easily cultivated, and stands well and long in the cool temperature of the conservatory, where it contrasts admirably with the varied types of vegetation.—G. WESTLAND, *Witley Court*.

Falconer’s Sikkim Rhododendron (R. Falconeri).—This is now in flower here; the plant itself, with its large dark leaves clothed on the undersides with a brown woolly substance, has a fine appearance; but when in flower it is exceedingly chaste and beautiful. The specimen of it here has produced a truss consisting of thirty creamy-white flowers, each of which measures from 2 to 3 inches across, and the whole truss about 2 feet 5 inches in circumference, forming a complete ball, which, being well up above the foliage, is shown off to advantage. This Rhododendron is seldom met with in general collections of greenhouse plants, a circumstance perhaps attributable to its being a shy bloomer; be that as it may, however, it is one of the finest of all greenhouse Rhododendrons.—CHAS. J. WHITE, *The Knoll, Baildon, Leeds*.

THE FLOWER GARDEN.

THE DOG'S-TOOTH VIOLET.

(*ERYTHRONIUM DENS CANIS*.)

WHEN, in early spring, the Orchids begin to blossom on the mountain fields of southern Europe, and the Hepatica sprinkles its stars under the Brambles, and in nooks everywhere, a beautiful and strange-looking flower is seen here and there on the mountain sides, among the stones and Grass. The flowers of this droop somewhat like the Cyclamen; and, though a very small plant, it has a flower of a lovely rosy-lilac, so large as to remind one of those tropical climbers more than of a true Alpine flower, which it is. The foliage, also, is singularly unlike any other Alpine flower, being deeply spotted with brown, so as to resemble some of the fine-foliaged plants popular in our stoves. This flower is the Dog's-tooth Violet, long known as an inhabitant of our gardens, but which, with many other flowers, has been for some years so neglected, that it was only in a botanic garden, or curious collection here and there, that one ever caught a glimpse of it. There is no flower known more worthy of a place in our gardens. It has several beautiful relations, mostly natives of America, but as yet scarce in our gardens. They will probably not be long so, as the fine *E. grandiflora* is abundant in the Rocky Mountain and Utah region; while the yellow Dog's-tooth Violet is common among the wild herbage in many parts of the Eastern States, as the Daisy is in our lawns. In our gardens the Dog's-tooth Violets thrive best in warm sandy soils; indeed, the beautiful European kind, the finest of all, is only seen in perfection in warm soils. It will grow in any kind of soil, but on cold clays one must frequently be content with the beauty of the leaf only, as the blossoms are not formed. Where clay soil occurs naturally, it is best to grow the plant in prepared soil, in a raised position, in the lower parts of the rock-garden or hardy Fernery. Where sandy peat or free loam admits of its thriving perfectly, the Dog's-tooth Violet should be abundantly grown, among the bulbous flowers that bloom in early spring, and it will look well either in clumps or small beds, or as a carpet beneath choice American shrubs in peat soil. The leaves die down more rapidly than those of most bulbs, and care should be taken that it is not injured by accidental disturbance. As a carpeting plant to small beds of choice growing shrubs, it would probably be as little liable to accidental destruction as in any other position. The roots of this plant suffer from being kept dry; and, therefore, they should, when taken up for any purpose, and not replanted soon, be stored in Cocoa-fibre or wet sand. We have never seen this plant in such good condition as in Messrs. Barr & Sugden's trial ground at Tooting, where large beds of it are studded over with its showy blooms. Mr. Barr cultivates the following varieties:—*E. dens canis album*, *majus* (red-purple), *majus roseum* (rose-purple), *majus album* (white, bottom of flower brown), and *Passiflora* (light purple, shading to blue).

A RIVAL ROSE TO COUPE D'HEBE.

I HAVE read, with pleasure and profit, "H. G.'s" useful remarks on Roses (see p. 270), and I quite agree with all he has said with the exception of his statement that we have in Auguste Mié a hybrid perpetual Rose nearly equal in shape and colour to the hybrid Bourbon Coupe d'Hébé. Of course the expression "nearly equal" is somewhat vague; but, assuredly, although Auguste Mié is a most valuable late autumn Rose, it is a long way from being like Coupe d'Hébé in colour or even in shape. It is always a great many shades lighter than Coupe d'Hébé, which is in fact the most perfect Rose in form and colour that we have, and a Hybrid Perpetual possessing the same qualities would be, indeed, a prize. At the risk of being criticised by "H. G." and others, I venture to name a Rose that much more closely resembles Coupe d'Hébé than Auguste Mié, and that is Charles Lawson. I have cut half-open buds of both so much alike in form and colour, that good judges have been puzzled to distinguish them in Rose vases. And yet, in general, Charles Lawson Roses are widely different from the matchless beauty of form and colour possessed by Coupe d'Hébé. I am surprised that the latter is not more grown as a standard than it is. It forms splendid heads, and, although it is not in any sense a perpetual Rose, yet it yields a long succession of flowers, for the branches

often show, at different times, fine clusters of threes and fives, which take much longer to come out than a single flower. Besides, a dozen or so of standards of Coupe d'Hébé, should be grown for its leaves alone, which prove invaluable for the autumnal dressing of vases and baskets of Roses. Indeed the foliage of this variety is the best of all for fringing bouquets of Roses. Charles Lawson, perhaps, also comes nearest to it in the usefulness of its foliage, a point rather too much lost sight of in the case of some of our Roses; for, in furnishing with Roses, it is often much easier to find fine flowers than the requisite quantity of fresh leaves and branches. One of the prettiest Rose bouquets may be made of the two varieties, Coupe d'Hébé and Boule de Neige. Buds and flowers, of different sizes, of these two, with the finest foliage of the former, form a charming combination. Coupe d'Hébé was the favourite Rose of my late employer, Lady Cullum, who, amid all the novelties and excellencies of the newer Roses, never gave up her ardent appreciation of Coupe d'Hébé.

D. T. FISH.

A VARIEGATED PRIMROSE.

(*PRIMULA VULGARIS* VAR. *VESUVIUS*.)

OF this, which is one of the prettiest of the variegated or fancy-flowered hardy Primroses, blooms were sent to us the other day, in beautiful condition, by Mr. Clapham, of Scarborough. It is very nearly related to the Polyanthus section, and not unfrequently produces its



A Variegated Primrose (*Primula vulgaris* var. *Vesuvius*).

rich violet-purple white-margined flowers several together on a scape. Mr. Clapham, indeed, remarks that he bought it in the Polyanthus state—that is, having many flowers on a stalk; and that, after a time, he was surprised to see it produce single flowers, as in the case of the common Primrose. Primroses, in short, have been crossed so frequently by florists, that their varieties are innumerable, and their characteristic peculiarities are in many cases confused or combined in the most perplexing manner—a fact well known to old cultivators of such flowers about the beginning of the last century. B.

PROPAGATION OF ALTERNANTHERAS.

ALTERNANTHERAS are much used in pattern and ornamental bedding, and as, in some places, it is hard to get a good stock, the following description of the method of propagation that we adopt may be found useful. In the autumn I take up a sufficient number of old plants, put them into 48-sized pots, and place them in a hotbed till they have rooted afresh. They are then placed on a warm pit or stove shelf through the winter till the present month. I make up a hotbed this month for them, and remove them into it, placing some cocoa-nut fibre between the stems of the plants. In about three weeks the plants are covered with young shoots, and all are well-rooted from the joints. So soon as they are grown sufficiently, the old plants are cut up into small pieces, some plants thus supplying fifty rooted cuttings. These cuttings are all potted off into small 60-sized pots, and plunged in the hotbed as thickly as they can be stowed away. The compost used is equal parts of loam, leaf soil,

peat, and plenty of sand. The glass requires to be whitewashed over with lime or whiting, so as to give the plants about the same amount of shade as is given by the use of canvas; they require to be kept very close while growing, and the shading must not be removed till the plants are large enough for bedding; keep up a moist heat by syringing night and morning, so as to encourage the growth. As soon as the plants are grown to the size required with occasional picking over to make them bushy and equal in size, the shading may be partially washed off, and more air given so as to colour them, as they will be found to have little or no colour while growing. As soon as the colour begins to show itself, and the plants are more hardened to the sun's rays, the whole of the shading must be cleaned off, and the plants get the full rays of the sun with sufficient air to keep them from burning or scalding; syringe every evening when the pit is closed. Soon after the full power of the sun is thrown on them, the plants get the required colour. After the colouring process is over, the lights may at first be taken off by day till they get sufficiently hardened to take off altogether. The above is a simple plan, but it saves time and the trouble of getting cuttings, and is a sure plan of getting good plants for bedding. The *Alternanthera* does not make growth in a stove or pit exposed to the full rays of the sun, but always requires shading under these circumstances. H. G.

NEW KINDS OF NEW ZEALAND FLAX.

AMONGST foliage-plants, the different varieties of New Zealand Flax deserve a leading position. To the original type (*Phormium tenax*) have been added six varieties, of which five are very ornamental. *P. tenax variegatum* is not only remarkable for its size, but also for its beauty. Its leaves grow obliquely to a height of 10 feet, and without becoming actually pendent are curved down gracefully at the points. The edges are green, and the centre a very beautiful yellow. The only drawback to this variety is that it too seldom produces off-sets by which it may be multiplied. *P. tenax Veitchii* is a magnificent and very vigorous variety, the leaves of which are straighter than those of the preceding kind, and are of a striated yellow. *P. tenax Colensoi*—The appearance of this plant is very handsome; the leaves are long, slightly curved, and striated yellow in colour. The plant is a very vigorous one. *P. tenax Cookii* is a compact plant, the leaves of which are comparatively short, stiff, straight, and of a variegated yellow colour. This variety, from which numerous suckers may be obtained, has the fault of being inconstant; it almost always produces suckers that are completely green, and others from which the slight variegation rapidly disappears. *P. tenax Saundersi* is a dwarf and stiff plant, the leaves of which are short, straight, and upright. The small dimensions of this variety fit it for introduction into small beds. *P. tenax atro-purpureum* is a very robust and vigorous variety, of a fine appearance, which reminds one of its type. Its leaves are very large; not variegated, but having a beautiful glaucous violet tint, which varies according to the growth of the plant, but never disappears. This is a highly ornamental and very remarkable plant, which unfortunately is still uncommon. The New Zealand Flaxes require a consistent and rich soil; a mixture of friable and leaf mould is adapted to strong plants; the off-sets should be planted in dry soil, coarsely broken up, that is to say, not pulverised. Waterings, which must never be neglected, should be frequent and copious when the plants are rapidly growing. The *Phormiums* are propagated from off-sets, which produce the strongest plants. To hasten the growth of the parent plants a bed should, about the first fortnight in May, be made in the open air or under a frame; this is then covered with sand and peat, in which the plants are placed; the soil is covered with a good mulching, and it is kept damp with frequent waterings. In the autumn the plants are lifted, and the off-sets detached. They are then potted, and placed in a close house, in which there is a brisk temperature. When the appearance of the parent plant is not a matter of consideration, off-sets may be more rapidly obtained by piercing here and there with the blade of a grafting knife the leaves which form the heart of the plants.—“*Revue Horticole*.”

Pansies for Spring Bedding.—When is the best time to plant seedling Pansies for spring decoration, and is manure beneficial to them?—*ENQUIRER*. [If not already done, these should be planted at once, as, in order to make a good display of bloom during April and May, they should be now good strong plants and full of buds. As a rule, the best way to get a good display of Pansy bloom in spring from seedling plants is to sow the seed in pans or boxes about the second week in July, and, when the seedlings are large enough, they should be pricked out into some shady place and kept watered until well rooted. These should make strong plants ready for bedding out directly the tender summer plants are removed; and, if the

soil about them is carefully stirred in the spring, they will soon make a brilliant display. Should the soil be very stiff and disposed to become hard during the winter, it is well to allow the planting out to stand over until March, by which time it should be well pulverised. Strong fresh manure is not good for Pansies, but they will thrive all the better for a good dressing either of old frame manure or rotten leaf soil.—A. D.]

Humea elegans as a Fine-foliaged Plant.—This has long been highly prized for the graceful pyramid of rosy-tinted flowers which it produces; but, it may not be generally known that its foliage alone renders it a valuable plant in the sub-tropical garden. It is superior in appearance to the various kinds of Tobacco plants, and its leaves have a distinct and powerful perfume. In order to have its foliage in perfection it must not be sown earlier than the end of September; it should then be grown on gently through the winter, in an intermediate house, and gradually hardened off by bedding-out time. Plants of it thus raised will show no disposition to flower; on the contrary, all their energies will be concentrated on the formation of foliage. As single plants for the centre of beds, or in groups, with the ground carpeted, they are very effective, and form immense specimens by the autumn, when it takes a considerable amount of frost to injure them. They will be found to be valuable for lifting, where large plants for conservatory or room decoration are in demand in winter.—*JAMES GROOM, Henham Hall*.

Sedum amplexicaule.—I think it must be conceded that Mr. Ellacombe's remarks respecting the suitability of this *Sedum* for carpet-bedding, would apply with equal force to *S. Lydium*, *glaucum*, and others, now so commonly used for that purpose. These, if scorched by the sun, and deprived of moisture, have a very withered appearance; but where grown on rich and deeply stirred flower beds, and well-watered during drought, are amongst the most useful and effective of carpet plants. My plant of *amplexicaule* is spreading over the soil with great rapidity, rooting in all directions, and, ere the close of the summer, I anticipate that it will have reached a diameter of 12 inches. As it has a close, compact, creeping habit, it entirely covers the soil as it proceeds. *Sedums* are usually commended as excellent rock plants, and during the winter months they will thrive fairly in such situations; but they suffer greatly during the summer. Now my experience of these creeping *Sedums* is that the better the soil, and, within limits, the moister they are kept, the better they thrive. Just a year ago, when planting out a narrow north border with Double Primroses, I pricked out along its margin a line of *Sedum Lydium*. This grew so rapidly that, ere the close of the summer, it formed a perfect evergreen edging about 6 inches in width. Of course it received a portion of the water supplied to the Primroses twice a week, and the treatment agreed with it. This same row has remained vigorous all the winter, and it would seem that cold and wet are less likely to damage it than heat and drought, for a similar edging in a hot dry border was nearly withered up.—D.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Dog's-tooth Violet not Flowering.—I have some purple Dog's-tooth Violets in a border of rather sandy soil; they have been there two years, and produce leaves in abundance but no flowers. Can any reader of THE GARDEN kindly tell me why they do not flower?—*H. A., Guildford*.

Spring-flowering Shrubs for Terrace Walls.—Two very ornamental spring-flowering shrubs for planting together on terrace garden walls are—*Cydonia japonica*, with its large scarlet blooms, and the beautiful *Forsythia suspensa*, which is a bright yellow. When well grown, they have a splendid effect in combination.—*A. H., Thoresby*.

Hardiness of *Aralia japonica*.—It is not sufficiently known that this strikingly handsome foliage plant is perfectly hardy. In the spring of 1872, I planted out several specimens of it, thinking they might answer as “sub-tropical plants,” and they have more than fulfilled my expectation; and though they have not had the slightest protection, they are at this moment unscathed, and in full vigour of growth. All lovers of beautiful-leaved plants should use this *Aralia* largely, either for growing in the centre of beds, or as isolated specimens on the lawn.—*W. WILDSMITH, Heckfield, Hants*.

***Linaria alpina*.**—Has this pretty continuous-blooming border plant ever been used for grouping in beds, or for rows in the flower garden? I imagine it might be worth trying. How much more interesting it would be if possessors of villa gardens, who persist in having masses of colour in their flower-beds, would use some of our hardy plants instead of such as are comparatively tender. Numbers, of all shades of colour, may be had, which, by simply keeping the flower vases well supplied with cut flowers from them, will flower till late in the autumn. Pentstemons, *Antirrhinums*, *Delphiniums*, &c., bloom thus if constantly cut from.—*R. P. B.*

Spring Gardening (Golden Feverfew and Forget-me-nots).—The past winter has proved, I think, that it is not safe to trust entirely to the plants of Golden Feather *Pyrethrum*, which were used in the summer bedding, for effect in the spring. Usually, for a few winters, I have arranged the Golden Feather in the May planting, so that it would do for the October planting, but I find that will not do. Lines and blocks of it all over the place have most irritating gaps in them. It must be sown in the summer, say with the Cabbages, and transplanted in autumn. Plants of *Myosotis dissitiflora* raised by division of old roots are not as hardy and frost-resisting as are seedling plants. This spring my old plants of *Myosotis dissitiflora* are nearly all gone, whilst the seedling plants are all safe. *Sylvatica* is here much hardier than *dissitiflora*, but not so easy to bloom.—*N. H. P.*

TREES AND SHRUBS.

THE OLIVE TREE.

(OLEA EUROPÆA.)

THE OLIVE is one of the most celebrated and valuable trees of the Old World, in many parts of which its culture forms the chief occupation of a large portion of the inhabitants. It cannot endure excessive heat or cold; therefore it thrives best in a mild equable climate. Its northern limit may be fixed at 42°, beyond which it is stunted and unproductive, although it frequently produces flowers in abundance. There are two varieties of the tree cultivated in Europe and Africa, viz., the long and broad-leaved Olives. The first is cultivated in France, Italy, and Greece, and yields the Olive-oil of commerce. The fruits of the broad-leaved Olive, which is cultivated in Spain, Portugal, and Morocco, is almost twice as large as that of the long-leaved kind, and has a strong and somewhat rancid taste. Without being strikingly handsome or imposing, the Olive is a picturesque tree. Its rough, gnarled trunk is erect, and often of considerable thickness, but seldom more than 10 or 20 feet in height. The bark is a dull grey, and, upon young trees, very smooth. The branches are numerous, regular, and massive, and clothe the trunk almost from its base to its apex. The leaves, which are not unlike those of the Willow, are small, lance-shaped, and ever-green. The flowers are small and white, and grow in clusters in the angles formed by the leaf-stalks with the twigs. The fruits, which consist of oval, unilocular drupes, are soft and pulpy, and contain a hard oblong kernel. During their various stages of development, they repeatedly change colour, being at first green, then pale, afterwards purple, and finally quite black when ripe. Both varieties of the European Olive have been transplanted to Mexico, Peru, California, and various other parts of America. It thrives well upon the western coasts of that Continent, especially in Peru and California. In 1870, there were 29,303 Olive trees in the latter country, where a large share of attention is now given to their culture.

Propagation.

In Italy and France the most common method of propagating the Olive is by means of layers. The branches selected for this purpose are pegged down and carefully covered with earth in winter, and are ready to plant out in the succeeding spring. Another method is to select strong roots, which are cut into lengths and planted with the lopped end slightly above the surface; in a few weeks each root sends forth a young shoot. Propagation is also effected by means of cuttings selected from strong healthy branches and planted in spring. In some parts of Italy it is a common practice to cut an Olive trunk into pieces, each about the size of an average Mushroom, to steep them for some hours in liquid manure, and then to plant them out in beds like Potatoes, covering them with a layer of earth from 3 to 4 inches deep; in a short time young shoots make their appearance, and in about sixteen months they are ready to be transplanted. Trees raised from seed are invariably of an inferior description, and produce only small bitter fruits containing little oil. Olive trees are generally two years old

when they begin to bear; they thrive best upon a calcareous or argillaceous soil, in sheltered situations and in valleys. The sea air seems to have a beneficial influence upon them, for trees planted near the coast are much more productive than those which are at a distance from it. Olive plantations are laid out in regular lines, the trees standing 30 or 40 feet apart, and various vegetables are planted in the intervening spaces.

Distribution.

The native country of the Olive appears to be in the regions around Aleppo and along the coast of Palestine, whence it was transferred to Greece. It was introduced into Italy B.C. 562, and was first planted in England in 1648. In the south of France and in the north of Spain it is a comparatively stunted tree, seldom exceeding 9 or 10 feet in height. The finest and most productive trees grow in Crete, where the best fruits are produced. The Olive possesses great vitality, and in its culture requires comparatively little care. Upon the Mount of Olives, at Jerusalem, there are Olive trees more than 2,000 years old, and in Crete there are also very old plantations still in full vigour. The age of a remarkable Olive tree at Villefranche, near Nice, is supposed to be 800 years. Its trunk, which is only 19 feet high, is 40 feet in circumference at the base. The fruit, however, begins to degenerate when the trees are about 100 years old. The wood of the Olive tree is of considerable

value, and is much employed by cabinet makers. It is close-grained, heavy, and fragrant, and capable of receiving a beautiful polish. Of other species, besides the European, the most important is the American Olive (*Olea americana*) and the Asiatic Olive (*Olea fragrans*), the leaves and blossoms of which are used by the Chinese for flavouring tea. The ripe fruits are gathered in September, October, and November, and after being thoroughly fermented, are crushed in mills,

in order to extract their oil. The best oil comes from Nice, Genoa, and Florence. The Greek and Cretan sorts are not so good, owing to the inferior method of preparing them. Olives for dessert are gathered when unripe, and are preserved in salt and water. The preserved Olives of Genoa and Marseilles are said to be the best.

JOHN HUTCHINSON, M.A.

Large Yellow-fruited Hawthorn (*Crataegus lobata serotina*).

A LATE-FRUITING HAWTHORN.

(CRATÆGUS LOBATA SEROTINA.)

THIS is the latest of all the *Crataeguses*, and therefore has not inaptly received the name of "serotina." It is a vigorous kind that attains somewhat large dimensions, being about 25 feet in height and most ornamental in appearance. Its leaves are large and handsome in shape; the fruit, when ripe, is of a very beautiful yellow colour, marked with brown specks, and ripens after most other trees have shed their foliage, a circumstance which gives additional value to this Hawthorn for ornamental purposes. Although in general appearance it bears a close resemblance to *G. lobata*, to which it is related, it is nevertheless very different as regards the period of ripening its fruit, and the persistency of its foliage. Thus, whilst *G. lobata* has spotless fruit, of a beautiful golden-yellow, which are larger than those of *G. lobata serotina*, and ripen in September and October, the fruit of the latter is regularly speckled with brown, and does not ripen till much later. Again, the leaves of *G. lobata* disappear in October,

whilst those of *G. lobata serotina* remain upon the tree throughout the entire season.

IVY ON EVERGREEN TREES.

Just 20 yards from where I am writing stands a fine, healthy *Pinus excelsa*, about 40 feet high, and 20 feet in diameter through the branches. I planted it 20 years ago, and not far from an old wall covered with Ivy; the voracious climber soon formed a dense carpet under the tree, and then ascended to its very top, and about three parts up the tree it forms a fine evergreen canopy, producing an abundance of berries for the starlings, the only birds I have ever seen eat them, and then only at breeding time. I made a tour to-day to view the trees that surround Lord Poulett's park, as I knew that the Ivy there had taken possession, and held its own against everything else, proving how the strong destroys the weak in the progress of development. As to its dislike to the Pine tribe, that opinion may here be quickly disposed of, for the Ivy has taken possession of thousands of trees, to which the Pine forms no exception; great numbers of Scotch Fir, and hundreds of towering Silver Fir, are clothed to their topmost branches with Ivy; and, although I carefully inspected the woods, I could find but few exceptions to its likings. Even the Beech, upon which "*Salmoniceps*" says (see p. 311) it grows sparingly, is, in many instances, pretty well covered. I must, however, say that the Ivy has an evident dislike to it, as it is the only tree, amongst the many other kinds in these woods, on which it makes but partial progress; the cause of this is doubtless owing to the bark of the tree being so hard and smooth that very little moisture is retained upon it, hence the rootlets of the Ivy cannot get moisture enough to sustain the plant. I now come to evergreen shrubs generally. On these I find but little Ivy; on most that I have examined none. Growing in front of my window is a large bank of luxuriant Ivy, and amongst it are the following:—*Cupressus Lawsoniana*, *Cryptomeria elegans*, *Euonymus japonicus*, *Thuja Lobbii*, *Thuja orientalis*, and some large bushes of *Aucuba*; on none of these has a twig of Ivy taken hold; nor has it laid hold of the smooth bark of the Mountain Ash, or of the Lime, and upon these I never have seen it grow. The Holly, too, does not seem to be one of its favourites. I have, however, recently found that my large *Wellingtonia* has got into its toils; a strong plant near it has run up its trunk 5 or 6 feet, and seems to embrace it with a firmness that augurs a determination not to relax its hold.

J. SCOTT.

Merriott.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The Red-rot of Pines.—This is said to be caused by the penetration and diffusion of the mycelium of a fungus (*Trametes Pini*) in the heart-wood, whose reproductive parts appear on the outer surface of the branches, especially in branch holes. The spores produced fall on the exposed surface of newly broken off branches, and thus red-rot may soon become widely spread.

Oak Galls.—According to Dr. Hollis these are divisible into two classes: one-celled, to which belong the woody Oak galls and the Currant galls; and many-celled, such as the spongy Oak-apple and the Oak-root gall. He believes that most, if not all, are formed during the growth of the leaf, the egg being laid in the bud; and that the different layers of the leaf can be made out in those of the gall.

Moving Evergreens.—Evergreen Oaks are the most difficult of all evergreens to transplant successfully. Before attempting to do so, they should be prepared by digging round them a year previously, and filling the trench with light, rich vegetable mould, in order to induce fibrous roots. As the plants which your correspondent wishes to operate on are large, I should advise him to thin out and lighten their heads, and to bind up the stems with Moss or hay-bands to keep the bark plump. The best time to transplant *Wellingtonias*, *Deodars*, and, indeed, all evergreens, is just as the buds are beginning to burst. There is no difficulty in transplanting *Hemlock Spruce* if done in the spring at this stage.—J. SHEPPARD.

Dead Clippings of Yew more Poisonous than Green.—During one winter here, when the old gardens and shrubberies were about to be done away with, the deer from the park frequently got in and cropped the Yews more than any of the other Evergreens. A few of the old bucks could not be kept out, for they jumped the fences nearly every night; but I never could find out that any of them were poisoned by eating parts of the trees when green, although the park-keeper thought they got thinner by doing so. Eating the Yew, however, is certain death to horses and cattle when the dead clippings or branches are left in their way; and I have known serious losses that have thus occurred. Many use sprigs of Yew for sheltering Peas and other tender vegetables in early spring; they should, therefore, be careful to burn them when no longer required.—WILLIAM TILLERY, *Welbeck*.

***Garrya elliptica* for Vase Decoration.**—I find cut spikes of this useful at this time of year, when flowers are scarce, for vase decoration. I have been cutting them for about six weeks, and they will last good another fortnight. A vase, the centre of which is filled with flowers, draped with them has a pleasing appearance. So fine a plant as we have here of this *Garrya* is seldom met with; it measures 12 feet in height and 10 feet in diameter, and it is covered with bloom from bottom to top. This shrub is perfectly hardy, but if it is not in a sheltered position frost sometimes injures the catkins. Give it, however, a dry soil, a south aspect, and shelter, and it will well repay any little trouble that may be bestowed on it. On walls and fences in cold situations, it does fairly well; but it succeeds best in the form of a bush, and it should never be pruned, as by cutting off the points of the young wood the bloom is destroyed.—W. DYERS, *Wierton House, near Maidstone*.

THE FRUIT GARDEN.

THE GOOSEBERRY.

(*RIBES GROSSULARIA*.)

THIS well-known and most useful fruit is a native of the north of Europe. In its wild state it bears small round or oval berries, which weigh one-fourth of an ounce; but it has been so greatly improved by cultivation as to produce fruit 2 inches in diameter, and weighing nearly 2 ounces. The plant is hardy, although the blossoms and young fruit are very liable to suffer from late spring frosts. It succeeds well, near the level of the sea, in the most northern parts of our island, and in Lancashire, Cheshire, and Yorkshire, it has been most carefully cultivated. Numerous Gooseberry shows are held in these counties; the Lancashire weavers especially devote much time and skill in bringing the berries to perfection. In the south of England the Gooseberry is frequently over-heated in ripening, unless care is taken to plant the trees in a rich and well-manured soil, and to prune them in such a manner as to afford sufficient shade. In America, a few varieties of the English sorts, and some of American origin, succeed tolerably well, and their growth near large cities is a source of profit; but our best kinds fail, as both fruit and foliage are liable to be attacked by mildew.

Propagation.

This is accomplished by seeds, cuttings, layers, or suckers.* The seeds should be taken from perfectly ripe fruit of the best flavour; they must be washed and dried, and then be sown in square pans filled with sandy loam mixed with leaf mould, or in the open ground in good soil. About May the young plants may be pricked out in rows a few inches apart; but, if not very forward, it is better to delay transplanting them until the following autumn. The seedlings generally bear fruit about the third or fourth year. Propagation by cuttings is the usual mode, and is performed in autumn, winter, or spring; strong, straight, one-year-old, thoroughly-ripened shoots should always be chosen. When the bushes are pruned, the wood should be selected, and every variety tied up and labelled separately. Each bundle must then be laid in the ground, with a little soil over the lower end, to keep the shoots fresh, until it is convenient to put in the cuttings. I prefer doing this about the middle or end of March; if planted out in the winter, they make little or no progress. Any spare corner is suitable for the cuttings. In making them, the bottom end must be cut clean through with a sharp knife or a pair of pruning-scissors. The buds should be taken out for 6 inches from the base; the spines may be left on, as they assist in keeping the cuttings firm in the ground. When the buds have been removed for 6 inches, 4 or 5 inches may be passed over, and the remainder of the shoot cut away; this leaves the entire cutting 12 inches long. The ground having been carefully dug over, the plants may be put in in rows 1 foot apart, 6 inches between each plant, and 3 inches of the stem below the ground, the soil being firmly pressed round each. During the summer, an occasional hoeing is required to keep the ground free from weeds. Layering long shoots or side branches is a quick way of getting a large plant. Soon after the bush comes into leaf, the lower branches, which it is desired to layer, should have a slice, an inch or two long, taken off their under side, near the part which is most convenient to rest on the ground, a strong wooden peg being placed over the branch and driven into the ground, so as to keep the cut part constantly close to the earth. Soil to the depth of 5 or 6 inches is then put over and round the peg, to cover a few inches of the wood. The roots formed from the edges of the wood and branches, in the month of May, may have taken sufficient hold by autumn to be severed from the parent plant. They can be planted out anytime throughout the winter. When the branches are too far from the ground to be brought down to it, the soil must be raised up to meet the branch. Another method of layering is to cover the point of the shoot with soil, pressing it firmly enough to prevent its becoming displaced; roots are soon formed at the point of the shoots, and a bud immediately makes its appearance. This grows in the form of a sucker for some time, when

* New varieties can, of course, only be obtained from seed.

side-shoots are thrown out, and, like the other ones which have been layered, they may be cut away and planted by themselves when the leaves are shed. Propagation by suckers is considered objectionable, as the plants so obtained are apt to produce suckers. In a well-managed plantation there should be no suckers; but, in the case of scarce sorts, it may be advisable to encourage them for the sake of increase. They should be planted in autumn, and transplanted a year afterwards, on which occasion the roots, whilst out of the ground, ought to be closely examined and every bud completely removed. By a little care, good plants with clean stems may be formed; and, if the shoots and leaves are kept healthy and vigorous, the disposition to produce suckers will be easily overcome.

Pruning.

Success in Gooseberry culture depends much on pruning, an operation which is sadly neglected in many instances. It may be performed at any time from November until the end of March, or before the bushes come into leaf. It is desirable to keep the centre of the bush well open, and not to allow the shoots to cross. A symmetrical form should always be preserved; but it should be remembered that without a very thorough thinning-out, no fine fruit can be expected. As a general rule, it may be safely said that one-half of the head, including old and young branches (more especially the former, as the young wood bears the finest fruit) should be taken out, leaving a proper distribution of shoots throughout the bush, the head being sufficiently thinned to admit the light and air freely. The branches should be kept as nearly as possible at equal distances, and laterals cut back to one eye if weak, or two or three if strong. Shoots, which start up with greater vigour than the generality, ought to be stopped in summer, unless they are likely to be wanted to fill up a vacancy. When there is an equal degree of vigour in the respective branches, the tree will be more healthy than if some were allowed to be too weak, in consequence of others becoming too strong, and the fruit will also be finer flavoured.

Planting and General Culture.

The Gooseberry is not very particular as to soil or position; it, however, succeeds best in a deep rich soil. Previous to planting, the ground must be trenched to the depth of 2 feet, a layer of strong dung being placed at the bottom of each trench, and a quantity mixed in with the soil nearer the surface. As soon as the plants are becoming crowded in the propagating rows, they should be lifted and placed in the prepared ground. The planting had better be done in the quincunx form; and if the distance between the rows be 6 feet, that of the plants in the row will require to be 5 feet $2\frac{3}{4}$ inches. These are good medium distances; but in rich soil they may be increased, and in poor ground diminished. There will be a spare piece of ground between each row for some time; and, until this space is filled up, a row of Cabbages, Cauliflowers, or any other vegetable may be planted between each row. The fruit is best flavoured from an open situation; but it must be remembered that a liberal top-dressing of cow-dung, or other manure, should be forked in about the roots every year when pruning is performed. In small gardens, it is better to plant a row of Gooseberry bushes round each plot, and other fruit trees can be mixed here and there amongst them. In a cottage garden, a row of bushes may be planted on each side of the small walks. In some places, they are grown as pyramids, or trained against walls and trellises; but I never saw them more successful than as dwarf bushes.

Uses.

This fruit is, in the first place, a very important one in its green state, being in high estimation for tarts and puddings. A delicious pale jelly is also made from it. The earliest use of it appears to have been as a sauce with green goose, whence the name. In its ripe state, it is a very agreeable table fruit, following the season of Cherries. Unripe Gooseberries are bottled in water for winter use, placing the bottles when nearly filled a few moments in boiling water, afterwards corking and sealing them, and burying them in a cool cellar, with their necks downwards. As a luxury for the poor, Mr. Loudon considers this the most valuable of all fruits, "since

it can be grown in less space, under more unfavourable circumstances, and brought into bearing sooner than others." The Gooseberry forming, as it does, a most useful article of food, and from its cheapness within the reach of every one, deserves to be more generally cultivated in our rural districts.

Varieties.

The varieties in cultivation are very numerous, and most of them have some valuable peculiarity to recommend them. Many, however, are scarcely worth growing for general use. The principal thing in forming a plantation, of whatever size it may be, is to select kinds which come in one after the other in succession. There is very little difference in the periods of ripening; but, in order to extend the season, the late sorts should be planted in the more shaded parts of the garden. The following kinds are the most suitable for cultivation as regards size and flavour:

REDS.		GREENS.	
Size.	Flavour.	Size.	Flavour.
London	Aston	Shiner	Greengage
Dan's Mistake	Crown Bob	Thumper	Keepsake
Clayton	Farmer's Glory	Stockwell	Green Walnut
Conquering Hero	Sportsman	Telegraph	Greenwood
Speedwell	Rifleman	Matchless	Jolly Angler
Ploughboy	Lancashire Lad	Green London	Rattler
WHITES.		YELLOWS.	
Antagonist	Princess Royal	Katherina	Champagne
Careless	Whitesmith	Drill	Rumbullion
Overseer	Smiling Beauty	Leveller	Yellow Ball
Snowdrift	Queen Anne	Criterion	Yellow Sulphur
King of Trumps	Royal White	Leader	Cottage Girl
Hero of the Nile	Sheba's Queen	Trumpeter	Teazer

Enemies.

There are several species of insects which are very destructive to the Gooseberry. The *Abraxas grossulariata*, or Magpie Moth, deposits its eggs on the foliage, and from them is hatched, in September, a slightly hairy cream-coloured caterpillar, spotted with black, and marked with orange along the sides, and which forms a loop in walking. It feeds on the leaves in autumn and spring, devouring all but the petiole; and, after entirely defoliating both Gooseberry and Currant bushes, it changes into a pupa in May or June, and in about three weeks afterwards the perfect insect makes its appearance. Hand-picking the caterpillars at an early stage of their growth, and, still better, burning the leaves on which the eggs are laid, are the troublesome means by which this destructive pest may be got rid of. Pouring over the bushes ammoniacal liquor diluted with water is stated by the late Mr. D. Beaton to be the easiest mode of destroying the caterpillars; but the strength of the liquor varies greatly; it is, therefore, advisable to ascertain, by experiment, the least amount of diluted liquor that may, without injury, be applied during sunshine to the leaves of some useless plant with tender foliage, and then add as much water as will ensure the safety of the Gooseberry leaves, without rendering the application too weak for the destruction of the insect. Another destructive insect is the caterpillar of *Phalœna vauaria*. It is about an inch in length, of a bluish-green colour, dotted with black tubercles, has ten legs, and, like the caterpillar of the Magpie Moth, forms a loop in walking. It changes into a pupa towards the latter end of May, and the perfect insect appears in the following month, or in July. Hand-picking, as soon as the larvæ are perceived, and dusting the bushes with hellebore powder, or with lime, are the means usually employed for its destruction; and, as the insect undergoes all its transformations on the ground, scattering newly-slaked lime around the bushes when the caterpillars quit is, perhaps, the best means of preventing the repetition of the mischief in the following year. The Gooseberry and Currant Saw-fly (*Nematus Ribesii*) deposits its eggs on the under surface of the leaf, by the side of the principal nervures, early in spring, and successive broods of flies appear until October. The larvæ devour the leaves, leaving only the petiole; and, when full grown, which is the case when they are about three-quarters of an inch in length, descend to the earth, spin a cocoon, and change into pupæ, from which another brood of flies soon emerges. Burning the leaves upon which the eggs are laid, and hand-picking where the plantation is not very

extensive, syringing the bushes, and then dusting them with lime, which should also be scattered round the stems, and sprinkling the leaves with lime-water, are the remedies usually adopted. Removing early in spring the soil from round the bushes to the depth of 3 or 4 inches, and burying it in deep trenches, in order to entomb the pupæ, is a good preventive measure. Syringing the bushes in the evening, and sprinkling them with salt or soot, as well as flowers of sulphur applied with a sulphurator, are likewise said to be infallible remedies. In addition to the formidable enemies above enumerated, birds frequently prove very destructive, by picking out the buds in spring. The remedy which succeeds the best with me is, immediately after pruning, to pass threads of white worsted, which need not be close together, a few times over the trees, winding them in and out of the branches. This effectually frightens the birds, who never attack trees so protected.

M.

Shading Pines.—Shading during strong sunshine may be, as Mr. Barnes says (see p. 294), an old-fashioned practice, but it is also a very general one, and is regarded as a means of securing perfectly developed fruit and foliage. In six different Pine-growing establishments with which I have been connected, shading was put on to keep the foliage fresh and succulent instead of scorched and leathery. Pine leaves are always tender after a winter's confinement in a close house or pit, and when strong sunshine is allowed to strike them before they are inured to it, scorching is frequently the result, and, therefore, the plants experience a serious check. Where shading is practised, it should be put on early in the season, and not about midsummer, when the mischief is done. I have often seen exposed crowns of large fruit burnt brown by the sun's rays in May, and it is no uncommon occurrence for fruit thus exposed to be ripened prematurely, at least its upper portion, while the lower half, which is more shaded by the leaves, is still green. The side most exposed is also subject to become partially broiled, an evil which shading prevents. I have seen larger fruit ripened in the shade than ever I have seen fully exposed to the sun. In recommending shading "by and by," I did not intend that light should be excluded; on the contrary, I only meant that the power of the fiercest rays should be broken. It would be difficult to manage an unshaded Pine pit during a hot summer's day when the outside temperature was above 100°. The fine specimens of Pines ripened under thick rough-rolled plate glass shows that black-heartedness is in no way connected with shading. Pine-apples differ greatly from such fruit as Peaches, Figs, Cherries, and Plums. These would be flavourless matured during the dull months of winter, but Pines attain as great perfection in this respect in the darkest months of the year as in those that are brightest. Shading, therefore, though antiquated, benefits rather than injures Pines.—J. MUIR.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Fruit Prospects.—A marvellous crop of Apricots has set on trees on my cottage, and the Peach wall is literally a sheet of rosy-pink bloom. Cold as the weather is, it is better for fruit trees than warm clear days and white frosts at night. Apples, Pears, Plums, and, indeed, all hardy fruits are full of promise.—A. D.

How to Improve the Flavour of Strawberries.—Just now we are putting ripe Strawberries into cold houses to cool and improve their flavour. Before any are gathered we go over them and into all the best pots stick small pegs. These we breed from for next year's forcing—and thus our stock does not degenerate, but improves by means of judicious selection.—R. GILBERT.

Thinning Hardy Fruits.—This year there is a great show of fruit, and if the blossoms escape destruction by spring frosts, there seems every likelihood of the trees setting heavy crops. Where such happens it will pay to go over them—Apples, Pears, Plums, &c.—and thin the fruit out, leaving, however, a good average crop; all the deformed and smallest fruits ought to be taken off. Not only will the fruits left be better in quality for being thinned, but the chances of as good a crop next year will be greater.—R. P. B.

Bloom Shedding in Forced Peach Trees.—I have Royal George and Newington both under glass, but, while the Royal George has set almost all its flowers, on the Newington not one has set. Both are of the same age and size, and each covers about 100 square feet. Last year the Royal George produced seven dozen well-finished fruit, while on the Newington there was not one dozen, although both made good clean growth during the summer which was well ripened. I shut up the house on the 9th of January, but used no fire heat until about the first week in February (the weather in January being extremely mild) and air was left on night and day. I can safely say that from starting them to the time when the Royal George was set, the temperature was never higher than 45° (with fire heat) or lower than 40° at night. I gave the house a good soaking with water at starting, and both trees were completely covered with bloom. In order to assist the setting I applied the camel-hair brush occasionally when the sun was shining. Both trees are making good clean growth; the border is inside the house. The Royal George is thickly set with fruit at present as large as marbles. Is the Newington a bad setter, or not adapted for house culture.—R. H.

RAVINE VEGETATION.

FROM a bridge spanning a ravine, as in the case of the annexed illustration, inviting, as it does, quiet contemplation, we are often enabled to discern minor objects of beauty which, under ordinary circumstances, would be passed by unheeded. Here a charming tuft of Moss covered with hundreds of its classical urn-shaped capsules supported on shining foot-stalks; there a tiny bit of Wall Rue embedded between the Lichen-covered stones—stunted it may be, but, nevertheless, happy and at home. A bit of the Maiden-hair Spleenwort peeping out from beneath the archway appears to express in the language, if not of flowers at least of Ferns, a desire to be more closely inspected. Well I remember once in a wild mountain tarn responding to such an invitation, and being rewarded by a glimpse of loveliness as regards Fern growth that, but for the pause in the ramble invited by the bridge and the supplementary invitation from the frondlets beneath, would have been overlooked. Rarely, indeed, has a closer inspection failed to reveal something unexpected—some little treasure that might be taken home as a special souvenir. The impressive grandeur of the rocks in the case now under consideration, piled in irregular jutting masses—here all but overarching the narrow stream, there anon expanding outward into a sort of graduated series of irregular and abrupt terraces, associated and contrasted with the finely developed fronds of the Ferns—could not fail to enchant all lovers of the romantic. Under the subdued light—moistened by the trickling drops that filter through the rocky crevices, and sheltered from the drying winds—many of our most charming plants find a fitting and congenial home, in which they frequently enjoy a magnitude of development that almost leads one to question their specific identity. What lovely masses of Moss festoon the face of the jutting rocks!—and, deep beneath, in the dark corners, creeps the Marchantia, and other Lichens, stealthily but surely performing their own infinitesimal part in the gigantic work of disintegration that is continuously in progress. Then, again, what an additional interest do the tortuous roots give rise to as they twist and twine in search of their scanty food, inserting themselves into every crack and crevice, and gradually growing in thickness, till they become gnarled with age, and in their growth assert the vital power of organic over inorganic Nature by displacing, at times, large fragments of rock into the stream below. Seeing then that these ravines have an especial beauty, and constitute a marked characteristic in our natural scenery, the question suggests itself—or ought to suggest itself—to every possessor of a garden, Is there any wild corner that could, by a little skilful manipulation, be metamorphosed into a ravine? The question once put and fairly thought over will, I venture to say, in a large majority of instances, receive an affirmative reply. It has been my lot to extemporise more than one, and in every case I have availed myself of an out-of-the-way corner, overgrown with Nettles, and previously a receptacle for nothing better than rubbish. Any attempt to imitate Nature on a large scale must necessarily be attended with considerable expense in the matter of labour alone, independently of the cost of massive blocks of rock, old roots, &c.; but there are gardens in which Nature has provided the necessary elements to form the groundwork, and it may not be out of place here to give a few hints by which the amateur may be assisted in the selection of such plants as are best adapted for beautifying the groundwork already formed to his hand. Where such a ravine is traversed by a stream and overshadowed by trees, few plants are more at home than the great majority of our hardy Ferns. Chief amongst them I would recommend the Royal Fern (*Osmunda regalis*) and the various other North American species—*O. cinnamomea*, *interrupta*, and *Claytoniana*; the delicate fronded *Onoclea sensibilis*, and the ostrich-plumed *Struthiopteris pennsylvanica* and *germanica*. The Oak-leaved Polypody (*Polypodium dryopteris*), whose delicate fronds are so susceptible of injury from dry winds and bright sunshine, should have a shady nook well supplied with leaf soil, wherein its slender underground stems may ramble freely. Should there be a trickling rill, as is not unfrequently the case, contributing its portion to the stream below, a little cave may be easily extemporised, wherein masses of the Filmy Ferns may readily be established, by simply attach-



A RAVINE NEAR SORRENTO.

ing them at the top between the crevices of the rock, and allowing them to hang down on the perpendicular face of any soft sandstone, to which their roots will in a short time adhere closely. In the bottom may be placed a plant of even the Killarney Fern, which, provided a regular state of atmospheric moisture can be maintained, will, under conditions such as these, flourish admirably. As creeping plants for covering damp soil and forming natural draperies, none are better than the common Moneywort, *Lysimachia nummularia* and its golden-leaved variety; also *L. nemorum*, whose yellow blossoms are very beautiful; and the *Sibthorpia europæa*, of which the advent of a handsome white-edged variety was alluded to in a recent number of THE GARDEN. The Golden Saxifrage (*Chrysosplenium oppositifolium*) dearly loves a damp locality. Associated with these there are many varieties of the common Ivy, all of which are equally happy in shade and sunshine. The Wood Anemone and the wild *Oxalis acetosella*, with the rarer *Paris quadrifolia*, and all the *Trilliums*, are well adapted for such a purpose. The several species of *Epimediums*, such as *pinnatum*, *violaceum*, *macranthum*, and even our common *alpinum*, are alike beautiful in their bloom and in the exquisite delicacy of their leaves when protected from the sunshine and east winds; but an abundant supply of good decayed leaf soil is always essential for them, failing which their growth will be unsatisfactory. As to shrubs and plants of a larger growth, our field of selection is somewhat more limited. The Spurge Laurels, both *pontica* and *laureola*, are grateful alike to the senses of sight and smell. Some of the smaller Bamboos from Japan and the Himalayas may be introduced at prominent parts with good effect; but where the overhanging wood is very dense, their place may be occupied by our giant and graceful Sedge Grass—*Carex pendula*—with handsome broad foliage and long pendent spikes of fruit, which it retains for a considerable time. The various species of giant-growing Angelicas, such as *atro-purpurea*, *decurrens*, and *lucida*, if given plenty of rich soil, will grow with a vigour and to a size quite surprising. Equally well adapted for the purpose is the rarer *Molopospermum cicutarium*, whose handsome sharply-cut leaves are equal in beauty to any of our Ferns. High amongst the rocks the fleshy root of the Black Bryony may be inserted, and, if it does not produce its beautiful scarlet berries, it will, at least, present graceful festoons of bright heart-shaped leaves, and, in the wild elegance of its growth, lend an additional charm to the scene.

J. C. NIVEN.

Botanic Garden, Hull.

Professor Asa Gray on Vegetable Mould.—Sometimes practice and science seem to be at variance; but, after a while, they make it up and come to a good understanding. Practice has always said that vegetable mould was a good thing to have in the soil, and that, somehow or other, plants obtain a great deal of nitrogenous nourishment from it. The proof of it was in the crops. The gardener thought the same, and his pot-plants gave convincing evidence of it. He has gone on saving his leaf-mould, and gathering it where he could, and putting his plants in it all the same; while the chemists were proving, to their satisfaction, that humus did not amount to much, and even have “seemed to prove that the fertile garden soil has little, if any, more power than so much sand to supply plants with nitrogen.” They could not find that the combined nitrogen ever got into the form of ammonia or nitrates. At last, says Dr. Gray in the “*American Agriculturist*,” it has occurred to one of the chemists, of a practical turn of mind, to test the matter by growing plants in pots, in the gardener’s way, supplying them with different quantities of vegetable mould, and withholding it from others of the same sorts, and then chemically analysing the plant to see what it had got. This has been done by Professor Storer, and a full account of the result will be found in the last (third) part of the “*Bulletin*” of the Bussey institution. Vegetable mould, especially in cool climates, where it most accumulates, and where also it is more useful than in warm climates, is a store that Nature has been an immense while in gathering, and which it costs nothing to use. Now, after hearing it depreciated by the chemists of late years, it is pleasant to see one of them come to the conclusion:—“There can be little doubt that, for the present support of agricultural crops, the vast stores of vegetable mould that have accumulated in the soil through the decay of many generations of plants, constitute a more abundant and more important source of nitrogenised plant-food than any other.”

GARDENING FOR THE WEEK.

Trees and Shrubs.

Transplanting Evergreens.—It will now be necessary to push forward the transplanting of these as vigorously as possible. Operate first on those that are most advanced; Hollies, Yews, and the majority of the *Coniferae* that make their growth later, may be left till the end of the month, as the season is a late one, and most shrubs are very backward. The longer Hollies are left, provided they are transplanted before growth actually commences, the more certain they are to succeed. The thing is to catch them just as they are on the move, and before the wood buds burst, as then they form roots very rapidly, through the impulse given by the growth of young wood and leaves. In removing valuable plants, the state of the atmosphere should be watched, and, if possible, a dull damp day for the operation chosen. This is the more necessary if the plants have to be carried any distance, as a dry state of the atmosphere would cause them to flag, and the tender roots would be liable to injury if allowed to get at all dry. It is of the greatest importance, therefore, that the plants should not be kept out of the ground longer than is absolutely necessary for their removal from place to place. When there are large numbers to transplant, the men engaged at the work may with advantage be divided into two gangs, the one in digging and preparing the holes, planting, watering, &c., while the others are engaged in lifting and forwarding the plants. In this way, the work can be carried on rapidly, and large numbers may soon be disposed of. Before filling-in, see that the soil is well washed among the roots, and allow all to settle for a night or so before finally filling up with dry soil. This will prevent the moisture from escaping, and keep the roots in a much more favourable condition than if they had been entirely covered in before watering. Indeed this is a bad practice, as the soil is sure to crack open, and let in large volumes of dry air that soon absorbs all the water that may have been given at the time of planting. To prevent this, and to keep the roots in a generally uniform state, they should receive a good mulching of half-rotten litter. The importance of this to newly-planted trees and shrubs cannot be over-rated; and I would urge on all engaged in planting not to neglect this necessary precaution if they would ensure success. Before attempting to remove and replant large fully-developed evergreens that have been standing a long time in the same situation, they must be well headed back, as the tops will be out of all proportion to the limited quantity of fibrous roots they can be taken up with. They need not necessarily be denuded of all branches and leaves, as, in heading back, the smaller shoots and sprays can be left; but nothing will be gained by leaving the large stems with a heavy weight of foliage that will make a larger demand on the plant than the mutilated roots will be able to supply. Stumps of plants may appear unsightly objects at the time, but they quickly break into growth at this season, and are sure to succeed; whereas, if removed with large heads, they would be hovering between life and death, and covered with unsightly brown leaves. Even if they survived they would not make such satisfactory plants as they do after heading down.

Pruning Evergreens.—Laurels, Evergreen Oaks, &c., that are required as screens to shut out buildings or any unsightly objects, may now be freely thinned out. A good many of the large branches may be entirely removed, so as to admit plenty of light and air to the lower part of the tree. By so doing, and shortening back the remaining stems, they will be found to break freely into growth below, thus forming plenty of foliage low down where required. A little timely thinning, and keeping the tops open, will prevent them from drawing up naked, and ensure the fulfilment of the purpose for which they were intended. Shrubberies, in like manner, soon become a wilderness of growth, if not looked after, and kept properly thinned, and choice plants are soon overgrown and spoiled by common free-growing varieties. Every plant should stand in a clear space, and any that are found to be encroaching or injuring the others, either by immediate contact or shade, should be at once cut back or removed. Such plants as common and Portugal Laurel may be headed back to within a yard or so of the ground, and these will form dense plants for removal another year. In pruning back others, it is necessary that it should be done with care and judgment, avoiding all stiff, formal shapes. Plants, of whatever kind, should be allowed to assume their own natural forms, as in this state they are generally far more pleasing. The pruning, therefore, should be done with the view to assist them in maintaining a natural, easy form of growth, which may generally be done by simply removing any loose straggling branches that are unduly taking the lead. Hollies generally assume the pyramidal form, and these and *Coniferae* should be looked to at this season, to see if there are rival leaders contending for the mastery. Should this be the case, the best situated for forming a fresh lead should be selected and all others removed without unnecessary delay.

Seed-sowing and Layering.—Haws of Thorns and Holly berries that have been buried in sand or other material for the last year should now be sown in beds prepared for this purpose. The seeds of Larch, and the different varieties of Coniferæ, as well as Alder, Birch, Chestnut, and other deciduous trees, should be sown in like manner. The beds for this purpose are most convenient for cleaning, if made about 3 feet wide; and, as to the length, that must be determined by the quantity to be sown. The soil of the beds should be removed to the depth of an inch or two, more or less, according to the size of the seed to be sown. Such large seeds as Chestnut should be covered to the depth of 3 inches, and Beech, Coniferæ, &c., in the same proportion, according to the size of the seed, but an inch or so may be stated as about the average depth to sow most of these. It should, however, be borne in mind that the larger the seed of any kind of plant the deeper will it be necessary to sow it, and *vice versa*. After sowing thinly and regularly over the surface, the soil raked off the beds previous to sowing should then be scattered evenly over the seed, and afterwards carefully raked level. The alleys should then be neatly marked out in the usual way. To prevent birds from pulling up and destroying the plants just as they are pushing through, it will be necessary to net them securely over; the beds must be closely watched, to prevent the depredations of mice or rats; for, should either of these destructive pests find them out, they will soon make sad havoc amongst the seed. Any young plants standing in the seed-beds should now be pricked out, in rows, about 6 inches apart, and others that have been previously treated in this way should be planted out in nursery rows, about a foot asunder. All young plants except deciduous kinds, that are standing in the nursery to gain size, should be dug up and replanted, so as to induce plenty of fibre, and prepare them for future safe removal. Layers of evergreens, that were operated on at this time last year, should now be examined, to see if they have made sufficient roots to warrant their being severed from the parent plant. If so, they should be at once removed, and planted in the nursery, or other convenient sheltered place, to make a season's growth, and their places may then be occupied with fresh layers. Before layering, the branches should receive a slight twist, so as to accelerate the formation of roots, and may then be pegged securely down, and covered with 3 or 4 inches of soil. Clematises root very readily in this way; and, where it is desirable to increase the stock of these, spare branches should be laid in at once. These have been much improved of late, and are a very showy free-blooming class of plants, suitable in many positions for garden decoration, especially for trellises, sloping banks, &c. *Lanuginosa* is still one of the handsomest, and should be in every garden. —J. SHEPPARD, *Woolverstone*.

Indoor Fruit Department.

Vines.—Insects are liable to make their appearance in Vineries as the hot weather advances, for heat and fresh air seem to favour their development as well as that of the Vine. Red spider is frequently a very troublesome pest, and when once established it is difficult to eradicate. If it appears on the Vines at an early stage of their growth it is certain to do a great deal of harm before the wood and fruit are matured, and it is best to use every endeavour to prevent it, if possible, from gaining any footing at all. This can generally be accomplished by giving the Vines a thorough syringing once a day with clean water, an operation which should be continued up to the time colouring begins. A sweet, humid atmosphere, and a consistent state of damp at the roots, assists greatly in keeping it down. Indications of its presence are shown by the leaves on the lower side becoming somewhat dingy or brown. It requires careful examination to see them where only a few exist. As their number increases delicate webs are run from vein to vein on the back of the leaf, and they are then more easily seen. From here they go on to the bunches and the old wood so that every part of the Vine must be syringed to penetrate into their hiding places. Insecticides of various kinds are often tried for destroying these pests. In many instances they are too late in being applied to be of much service, for, to be effectual, they should be used more as a preventive than as a cure. Thrips is another miniature Vine pest, capable of doing a considerable amount of evil, that usually accompanies the preceding. It is larger in body than the spider, but somewhat long and very slender. The young are white, and the old black, in colour, and they fly from one place to another. Their favourite resorts are the points of young fresh-growing shoots; they eat small holes in the tender leaves, and some parts become almost transparent where they have been at work. The growth of the part which they attack is generally arrested, and this assumes an unhealthy appearance. Syringing is of some use, but to exterminate them the house in which they are must be fumigated with tobacco smoke for two or three evenings in succession; the house should be filled until the smoke is so dense that the hand cannot be seen at a distance of 2 feet from the eyes. A washing

with the syringe or garden engine should be given to the leaves after the fumigation is discontinued. Mealy bug, when established, is one of the worst insects to clean from Vines. Little or nothing can be done towards its destruction while the Vines are in leaf. A look-out should be kept for it throughout the growing season, and the Vine marked, wherever it is seen, for cleansing when the Vines are pruned and dressed. These remarks apply to young Vines in pots as well as old established fruiting ones, none of them are exempt from their intrusions, but are all generally liable to their ravages. *Phylloxera vastatrix* might be mentioned in addition to these enemies; but the comprehensive descriptions of it already given in *THE GARDEN* render more than a passing allusion to it unnecessary.

Pines.—Whilst insects infest the wood and leaves of many plants, the Pine is all but vermin proof. When care is taken not to place any other plant near them years may elapse before a single insect is seen upon one of them. Stove plants are sometimes set about spare corners in the Pinery, and in such cases bug and scale are not slow to change their quarters. It is very difficult to remove the bug from amongst the foliage, especially if it finds its way down about the base of the leaves. It is preferable to destroy a few plants to get rid of it, if the others are clean, rather than keep all and have the whole infested. Small suckers may be washed with a brush and soap and water, when they are taken from the plant and before they are transferred to their sucker-pots. Brown scale is an enemy common to many Pines. Its presence appears to do little or no harm, and it is more inclined to attach itself at the apex than further down the leaves. It may be brushed off; and, if the plant be dipped into water heated to 130°, the scale will not survive. The white scale is more destructive than the other, and is considered the worst pest which affects the Pine. It eats the leaves, and has a very enervating influence on the plant. It multiplies fast, and spreads to every nook and corner to which it can get the slightest access in a very short time. The remedy recommended for the brown scale will do much towards keeping the white kind in check. Where this fails it is doubtful if the house will be perfectly clean until an entirely new stock is introduced. —J. MUIR.

Peaches.—Where Peaches have stoned, the houses may be kept warmer and the moisture increased, so as to push on the second swelling of the fruit; this is the period when lost time can safely be made up by extra forcing if ripe fruit is wanted by an early date. The trees should be gently syringed early in the morning and about three o'clock in the afternoon, the houses being shut up with a temperature of 80° during bright weather. With the sun early on the glass, ventilation must be seen to in good time, or the heat will be too strong at the apex of the house, and will damage the foliage. A good watering may now be given with guano-water or other liquid manure, or the manure may be spread on the border and washed in by watering, which must be done thoroughly, as the want of sufficient moisture will cause the fruit to look pinched, and finally to drop off; it will also sometimes cause the fruit to gum at the second swelling, disfiguring it, and totally spoiling its appearance for dessert. In houses where the stoning process is in progress, a steady equable temperature must be maintained, with plenty of air. No attempt at pushing the trees at this period must be indulged in, and care must be taken that the number of fruits is not in excess of the capabilities of the trees to mature them thoroughly. Trees that are overtaxed this year may show it the next season by refusing to yield a crop. One fruit to every square foot of surface is plenty in the earliest house, but more may be allowed in later houses. Early York is still our best early Peach; Royal George and Noblesse, in the same house, are equally good, though a shade later; whilst *Violette Hâtive* is the most forward Nectarine. Attention may be given to pinching and training in the young wood in early houses, overcrowding being avoided. It is not necessary to be rigidly particular in "tying in" early; the growth may be allowed considerable freedom for a time while the fruit is swelling, but should be tied down before the ripening period, so that the rays of the sun upon the ripening fruit may not be obstructed. No more spray should be allowed to grow than is absolutely necessary. The weather has been highly favourable for setting the fruit in unheated houses, and the syringe may now be freely used during all fine mornings. Disbudding will also require attention, and if small colonies of black aphides should make their appearance in places, and it is not thought worth the expenditure of tobacco to thoroughly smoke the houses, a few puffs of Pooley's tobacco powder will be found effectual for a time; it should be applied after the trees have been syringed. Although it is not so effectual a remedy for fly as fumigation, it is the safer one while the young foliage and fruit is still tender. The set of fruit in cool houses have been remarkably rapid this season, the first anthers which burst being sufficient in each flower to fertilise the future fruit, the rest of the anthers withering immediately, and not bursting at all; this we attribute to

the very favourable weather. Proceed to thin the young fruit in good time, and do not waste the energies of the trees upon a mass of useless fruit grown to the size of Peas before they are thinned out.

Melons.—We do not wait for a full crop of fruit to set on the earliest Melon plants, but are content with two or three on each to begin with, and when these have half swelled more will set in abundance. It will be necessary to impregnate by hand the blossoms in the earliest house, choosing the middle of the day when ventilation is active, though the process may be equally effective in the morning or afternoon, even when the house is saturated with steam, provided the flowers are not actually wet with water. See that there be no lack of moisture at the root, especially when fruit is swelling, as dryness will be the sure forerunner of red spider, and of badly swelled and badly flavoured fruit. Do not unnecessarily wet the necks of the plants at the surface of the soil; a pot split into two halves, which are inverted and placed round the stem of the plant so that it comes through the hole of the pot, will be found a good safeguard against wet from the syringe or heavy watering. A succession should now be planted, and more plants raised from seed to fill up pits by-and-bye, when bedding plants have been removed.—W. D. C.

Flower Garden and Pleasure Grounds.

The weather, during the months of February and March, was much colder than it was during January, consequently spring flowers, as well as vegetation generally, has been more backward than is usually the case. Various kinds of early-flowering plants and spring bulbs are now, however, in full beauty, and others will be in equally good condition before long, and should, therefore, have every necessary attention, as the time during which such plants can be allowed to occupy the flower beds must this season be short. In cases where the flower beds are unoccupied, and where it may be intended to use hardy plants for the purpose of forming edgings and divisional lines, this may be attended to now, or as soon as the beds have been properly enriched by the addition of fresh soil or manure, as it is an advantage to get such plants somewhat established before very warm or dry weather sets in. Such plants may consist of the *Cerastium tomentosum*, *Santolina incana*, variegated *Euonymus radicans*, *Veronica incana*, *Stachys lanata*, and several other species of hardy plants, remarkable on account of their foliage, together with such succulent plants as the well-known *Sempervivum californicum*; also the useful *Echeveria secunda glauca*, which may now be safely planted out, as it is nearly, although not altogether hardy. If the stock of *Stellaria graminea aurea* is insufficient it may still be increased by means of division or cuttings; this is a useful plant for carpet bedding, and will probably be found to form a better companion for the various *Alternantheras* than even the Golden Feather *Pyrethrum*. Hardy herbaceous plants on the margins of shrubberies, and elsewhere, and Alpine plants on rock-work, will now be interesting, and should have whatever attention they may require, such as filling up any vacancies which may exist; and provision for this should always be ensured by wintering a few plants of each variety—or, at least, of the most choice species—in pits or frames. The soil in which such plants are growing should also be enriched and slightly forked up, and the dimensions of plants which may have become too large should be reduced. Many kinds of hardy trees and shrubs are usually increased by “layering,” and the present is a suitable time for the performance of such operations, which should receive early attention in order to give the layers as long a season as possible for the formation of roots. This operation should be performed in much the same manner as that practised in the case of Carnations and Picotees—viz., cutting a sort of tongue with a sharp knife, on the under side of the branch, at the part intended to be inserted in the soil. Let the knife enter the branch to the depth of about one-half its thickness, and cut from the base upwards for about 2 or 3 inches; in the slit-up portion of the branch insert a small wedge, or piece of stone, to keep it open; fix this part firmly in the soil, and keep it in position by means of a strong peg. Such layers will generally form abundance of roots during the ensuing summer, and, in some instances, they may be found sufficiently rooted to be separated from the stools during the succeeding spring, when they should be trimmed and planted in nursery lines, where, with proper attention, they will soon become well-formed plants. The presence of sufficient roots, or otherwise, however, should always be ascertained before severance from the stool takes place. Take off cuttings of Dahlias, pot them in small pots, and place them in a hot bed until they are fairly rooted, when they should be gradually hardened off, along with other kinds of bedding plants. Continue to prick into pans or boxes the young seedling plants of the various blue Lobelias, and the Golden Feather *Pyrethrum*. Old plants of this useful bedding plant need never be saved, unless for the purpose of producing seed, as seedlings are best for all purposes. Plants intended for furnishing vases and baskets

during the summer, in the flower garden or elsewhere, should now be shifted into larger pots, so as to have them of sufficient size to produce an immediate effect when the season arrives for placing them in the open air. The various kinds of Zonal or bedding Pelargoniums are mostly used for this purpose, and with good effect, as they generally produce a great abundance of bloom. Such plants as the *Fuchsia fulgens* are also well suited to this purpose. The most graceful and appropriate plants for vases, however, are those with sword-like leaves, such as the Aloes, *Dracænas*, *Yuccas*, *Tritonias*, the New Zealand Flax, and *Agapanthus umbellatus*. Plants of a trailing habit of growth should be planted round the margins, to hang over the sides; and, for this purpose, the Ivy and hybrid Ivy-leaved Pelargoniums are well suited, together with such plants as *Campanula fragilis*, *Convolvulus mauritanicus*, and blue Lobelias.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Roses.

See that all Rose trees are properly staked and trained before they get too far-advanced into growth, as the heavy winds during this month often do great damage to the young shoots where they are not carefully trained. The season for Rose tying and training is now advancing; great care must be taken not to rub or break off the buds of last summer's budding, and slightly protect all tender varieties. Look carefully over all trees, as the caterpillar will, in warm gardens, be found to have attacked the buds when these have advanced far into growth, and Roses require carefully looking over every week, to keep down such pests at this season of the year. Prune all late-planted Roses very close, as they are more likely to break and flower well than when left with long shoots to form a large head. In some gardens more than others, the Roses get much covered with Moss. In that case, it is advisable on a dry day to have it well cleaned off, which may be done easily by hand-rubbing. Then wash the stems over with some soap-suds, mixing some soot with the water. This will be found quite sufficient to kill all Moss, and will in no way injure the tree, but give the stems a perfectly healthy appearance.—H. G.

Kitchen Garden.

This is a good time for making a full sowing of the various kinds of Broccoli and Winter Greens to succeed those sown earlier. All early sown plants should, of course, be transplanted. To sow early, with a view to having a long growing season and perfect development, and then allow the plants to remain starving in the seed-bed, is worse than useless, and I do not wonder at anyone who adopts this method complaining about their bare and spindly habit. Many a suggestion, good in itself, is condemned through being imperfectly understood or carelessly carried out. Few, I suppose, will deny the advantages of transplanting Broccoli and other plants of a similar nature from the seed bed for a few weeks before being finally planted out. Overcrowding, when young, has the same debilitating influence upon plants as upon animals, only the lives of vegetables being generally of shorter duration the effect, perhaps, is not so apparent. I know it is only by the greatest exertions that the ordinary garden operations can be accomplished, especially at this season of the year, and some things that may be considered very necessary cannot always be carried out from a severe pressure of other matters that must not be postponed, but an effort should, in all cases, be made to transplant the main portion of what are commonly called Winter Greens and Cauliflowers, to enable them to gather strength till the land is vacant to receive them finally. Salsafy and Scorzonera should also be now sown thinly in good deep land, in drills, about a foot apart. Chicory may also be sown shortly. This makes a useful salad plant, when forced and blanched in winter. Sow twice this month early spring Cauliflowers, to make sure of having plenty of plants to put out when required. Sow the Red-stone Turnip about every fortnight or three weeks; this will be found more satisfactory, especially in difficult places, than depending upon one large sowing. Covering with the charred refuse from the rubbish-heap, first passed through the sieve, has a wonderfully stimulating effect, and prevents the attacks of fly. I am so thoroughly impressed with the value of this that I have always a heap saved for covering all small seeds. Shift on Tomatoes to have large strong plants to put out about the end of next month; Capsicums may yet be sown in heat, and the early-sown plants pricked out and forwarded. Ridge Cucumbers may be sown in a gentle hotbed, but a strong heat is hardly necessary; a portion of the seeds may be reserved for sowing on the hills under hand-lights next month; such plants often do better than those nursed in heat, especially in modern days, when much room is taken up by bedding plants. After the rains of the past week it is probable the weeds will soon become troublesome, and no time should be lost in getting rid of them before they have made much head.—E. HOBDAY, *Ramsey Abbey*.

THE GARDEN IN THE HOUSE.

A PORTABLE AQUARIUM.

THE accompanying illustration represents a simple and useful little parlour aquarium, in which many small exotic aquatics and some of our native water-weeds will grow as well as in a contrivance of greater dimensions. It consists simply of a glass vessel, similar in shape to an ordinary bell-glass, but furnished with a stand, and covered either with another bell-glass or an ordinary glass shade. A handful of sandy soil or gravel and a few shells at the bottom serve to hold the roots of *Vallisneria*, *Aponogeton*, *Chara*, and other water plants. Soft water is best for filling the glass if it can be obtained, and one or two golden carp add brightness and life to such an arrangement, and give motion to the water. Aquatic plants, or such of them as will grow in a vase of small dimensions, very rarely produce flowers, and, in order to counteract this want of brilliancy, a



A Portable Aquarium.

vase of cut flowers may be introduced, as shown in our engraving, and they will last fresh and beautiful for a much longer time than when they are fully exposed to the gas or fire-heated atmosphere of the sitting-room.

B.

Bouquet Flowers.—The weekly supply of cut flowers and pot plants increases; indeed, anyone who pays a visit to Covent Garden Market will be well repaid for their trouble, as the spring flowers are, to my mind, much prettier in bouquets than those in bloom later in the season, and a goodly array of both hand and button-hole bouquets is just now exhibited for sale in the windows in the Central Arcade. Amongst other cut flowers obtainable may be enumerated the following:—Azaleas, Bouvardias, Camellias, Carnations, Cinerarias, Cyclamens, Daphnes, Deutzias, double Pelargoniums, Eucharis, Heaths, Fuchsias, Forget-me-nots, Gardenias, Heliotropes, Hyacinths, Lily of the Valley, Mignonette, Narcissus, Orchids, Pelargoniums, Primulas, Primroses, Roses, Snowdrops, Scillas, Spiræas, Stephanotis, Violets, white Lilacs, and others. Button-hole bouquets are mostly made of Bouvardias, Camellias, Gardenias, Lily of the Valley, and Scillas, with the addition of Ferns and other foliage, according to taste. A pretty hand-bouquet, which I saw last week, was composed of the following, viz., a white Camellia, four Gardenias, some bunches of Violets, White Lilac, Azaleas, Lily of the Valley, and light Ferns, a fringe of Ferns being formed round the edge, so as to rest lightly on the bouquet-paper. This bouquet would be anything but effective if subjected to artificial light, but during daylight is very pretty.—A. HASSARD, *Upper Norwood*.

ON ALLOTMENT GARDENS.

By RICHARD JEFFERIES.

An allotment is a small piece of land devoted simply to the growth of table vegetables, or other plants of a strictly utilitarian character. Almost all villages which are situated in the midst of an arable district have one or more fields entirely given up to labourers as allotments. These are allotments properly so called. But, ascending still higher, there are other allotments to be found in the outskirts of rural towns. These are often on land which is in the market for building purposes, and you may see a board offering "This eligible site for sale" affixed to a pole rising out of a plot of Potatoes. The same thing occurs in large cities, near their edges, where they blend with the country; only here the true allotment is frequently lost in the market garden. In many country places there are large tracts of land which have been left centuries ago as a gift to the adjoining town, or presented to it by the then monarch, in recompense of services rendered by the inhabitants. As a rule, perhaps, these tracts of common-land will be found to be pasture; but instances of arable fields do occur, and, in certain examples, these extend to hundreds of acres. The occupation and use of these allotments is vested in the burgesses or aldermen; and minute laws have been elaborated in the process of generations regulating their distribution among the inhabitants. Although these tracts of land are not commonly so considered, in point of fact they are really and truly allotments, and come within the discussion. They are allotments on a larger scale, and governed by a recognised code; and as they have been in existence time out of mind, the lessons to be learnt from them cannot be overlooked. In visiting and examining many allotments I came to the conclusion that, allowing for slight differences consequent upon position, there was a great similarity in each instance to others of the same class. In commencing this examination it seemed natural to begin with the gardens attached to the cottages, and which, in certain places, are little more than allotments—that is, used for purely utilitarian purposes. The greatest amount of variation existed as to the size of the garden. Some cottages had barely enough to grow a few boilings of early Potatoes, the cultivated ground consisting of a narrow edging in front of the dwelling, and separated from the road only by rude palings. The inhabitants of these somewhat unfortunate places were always eager and anxious to obtain an allotment, but could not always do so, even though they were willing to pay a fair price and to walk considerable distances to it. The reason was that the allotment field was only just sufficient in size to supply the wants of those cottagers who resided in the immediate neighbourhood, and worked upon the surrounding farm. These, of course, had the preference in the letting of the lots, and rarely could an outsider obtain a piece. These cottagers, either being squatters or really the owners of their houses, and thus independent, and perhaps sometimes disagreeable in the habits of their lives to the adjacent farmers, could not persuade them to allow a plot of ground to be broken up. The result of these untoward circumstances was, that the cottager had, in great part, to go without vegetables, or else to purchase them, which he was often unable to do from their scarcity and high price. A little further along a cottage would occur to which was attached a small garden, perhaps 20 yards long by 5 or 6 wide, taken, no doubt, years ago from the waste at the roadside.

Cottager's Fruit Trees.

This cottage being held on quit rent, and therefore practically a freehold, the labourer and his forefathers had dwelt on it for three generations, and their taste plainly displayed itself in the garden, which was crowded with fruit trees of all descriptions, for it is a characteristic of the labourer that he seems to possess a singular fancy for planting one at least of every kind of tree and shrub, so that these small patches often contain as many varieties as really large gardens. Here are Apple trees, generally of old, Crab-like, and now disused sorts; always Bullaces, for which the labourer has a special predilection—their rough, though not unpleasant acid, is, no doubt, exactly suited to a palate accustomed to a long dietary upon bacon and bread and cheese—Damsons, Pears, and a small black Plum, which is also a particular favourite, and even, in one or two instances, a Walnut tree and a Filbert bush. Gooseberry bushes, Currants, not so often Raspberries, all crowd the confined area, and injure by their roots and shade the growth of the table vegetable. These, too, are of the most varied character. The whole area would be barely large enough to grow sufficient Potatoes for the family; but, instead of being devoted to that purpose, it is split up into half-a-dozen tiny plots, containing at least two varieties of Potato (there must be variety), Peas, Kidney Beans, Broad Beans, Parsnips, Carrots, Onions, and a few Lettuces. The profits of such a garden entirely depend upon the fruit trees, which sometimes, in favourable seasons, will yield sufficient to pay the entire rent and leave something towards winter clothing. The produce of a single good Plum or Pear tree will

amount to as much as two pounds, and, as no care has been expended on the cultivation and production of the crop, it is looked upon as peculiarly remunerative. But these returns are singularly uncertain, and years may go by without a single penny of profit. From the Parsnips the housewife makes a wine, as also from the Gooseberries and Currants, and occasionally from the Elderberries, which grow in profusion upon the hedge which bounds the garden, and which, in nine cases out of ten, is of Elder. These home-made wines are looked upon with great favour by the labouring class. Sometimes a labourer, whose father was perhaps a carpenter or blacksmith, has possession of a real orchard, though a small one—a piece of enclosed ground entirely planted with fruit trees, Apple in the centre and Plum near the outside. This is, in good hands, a source of considerable revenue to him. Instances of this kind are not so rare as may be imagined. The fruit of these small orchards has not been selected with the care exercised in the gardens of the upper class; it is mostly rough and acid, but it finds a ready sale in rural districts. The farmsteads generally possess an orchard in counties and localities where the Apple will grow; but in most cases these orchards have been planted by a previous generation, and the trees are fast decaying, while the sorts are no better than those in the labourer's garden. The result of the custom of overcrowding their small gardens with so many varieties is, that the cottager is anxious to obtain a separate piece of ground, which he may devote entirely to Potatoes and Cabbage. Some of them have long narrow slips by the roadside, for which they pay quit rent; and these are in reality allotments, with the difference that they stand solitary. Here the labourer grows his stock of indispensable vegetables. The size of the allotment granted to labourers in the corners of arable fields varies almost in exact proportion to the richness of the soil. If the soil is good, the allotment is comparatively small; if it is poor, it is large in area, though nearly similar in productive power. Thus, on down land, where the soil is thin and lies on a substratum of chalk rubble, with layers of flint, these allotments on the outside of arable farms often extend to a quarter of an acre, and even in exceptional cases to more than this. The field set apart for allotments in a genuine agricultural village, where the larger area of land is arable, is not an interesting object to look at. It is always close to the road: this is absolutely necessary on account of communication. The fences are mere mounds; all hedges being kept shorn close so as not to harbour birds. The ordinary plan is to have a cart-track straight through the field, from which paths branch out on either hand leading to, and at the same time acting as divisions between the lots. In the early part of the year the field has a most varied and patchy aspect from the innumerable small squares of various vegetables, each with its different shade of green. In autumn and winter it is desolate and an eyesore, unless where the rule of the rental compels the occupier to keep their lands clear and to remove or properly stack the refuse. Our labourers are not picturesque at this their favourite work of allotment gardening. The costume is against it; especially that of the women. Women do a great deal of work upon these allotments. They can pick weeds and hoe nearly as well as men: these always, however, retain to themselves the conduct of the sowing. One of the finest allotment fields I know is part of the glebe land of the parish rector. The former rector, with a foresight and spirit that did him justice, gave up these 8 acres as an allotment field with the object of reclaiming his village, which at that time did not bear a very good character. The people were sparsely, ill-lodged, and without gardens. No better plan could possibly have been devised. It answered to perfection. It gave the labourers occupation in their idle evening hours, thereby keeping them out of the ale-house. The very children could come and help, and took an interest in the growth of the plants. The men had something to think about besides drinking and grumbling. Gradually the whole village grew morally healthy. When the good rector passed away, another took his place who continued this really good work. To this day the result may be seen. This parish has few paupers, fewer criminals, less idle discontented men than the surrounding districts. The great object to be sought in the distribution of allotment grounds is, that there should be sufficient in each case to grow on one-half of the plot Potatoes enough for the family, while the other half is sown with other vegetables, and, in fact, lies fallow. This is the same thing as a rotation of crops. That the allotment resembles a farm is a fact that must have ere now been apparent to the reader; but there follows an illustration still more pointed. This particular allotment-field, though it was well situated, and comprised some first-rate soil, was rather low, and retained too much water. The landlord determined to drain it, and he did so in the way which cannot but strike every one as singularly fair. He bought the drain-pipes as his share of the cost. The pipes were put in by labourers who were paid the usual price for this work. Then the amount of this labour was divided out amongst the various tenants of the allotment.

grounds, so that each paid a share in proportion to the size of his plot. The largest allotment was 48 perches; and there were holdings of allotments of 16, 20, 25 perches, &c. This is a purely agricultural contract, and forms a fair precedent as to what should be done under similar circumstances. On this allotment-field, as in all others where anything like order prevails, the fences are kept as low as possible, and no hedges or mounds are allowed—the division is simply a green footpath. It is surprising that the plan of thus turning a portion of the glebe-land into allotments has not been more generally followed. A readier means of encouraging industry, and doing an immense amount of practical good, could not be discovered.

Allotment Rules and Regulations.

The following code of regulations, in reference to allotments, has been in operation for thirty-five years, and may therefore claim to possess a title to serious consideration. In this case the allotment gardens are the property of the lord of the manor, and are situated in a small village, distant from any town, and entirely composed of an agricultural population. "Rules.—1. That the tenant shall hold his allotment, as a yearly tenant, from the day of , after the rate of 4d. per lug (or perch), free from all rates, tithes, and taxes. 2. That the rent shall be punctually paid by the tenant to the landlord, or his agent, on the 28th of September in each year; but, if that day happens to fall on Sunday, then on the day preceding. 3. That all parochial rates, tithes, and taxes shall be paid by the landlord. 4. That the tenant shall keep the bounds and fences which join or belong to his allotment in good repair, and shall not trespass upon any other land in going to or returning from his allotment, or in hauling any manure thereto, but shall use and keep the regular and appointed road to and from the same. 5. That the tenant shall cultivate his allotment by spade husbandry. 6. That, on the tenant removing his residence from the village, he shall no longer continue in the occupation of his allotment. 7. That, if the tenant shall be convicted of felony, of any breach of the game laws, or do or commit any act punishable by law, or shall wilfully trespass or encroach upon the land of another tenant, or underlet any part of his own allotment, or make default in the payment of his rent at the time above-mentioned, or fail to perform any of the foregoing conditions, he shall immediately forfeit his interest in the land, together with his crop upon the same; and the landlord, or his agent, shall be at full liberty to take possession thereof, and to enforce the payment of all rent then due by sale of the crop or otherwise, as in cases of rent in arrear." The practical nature of these rules is at once apparent, and forms their chief recommendation. Rules 3, 4, and 7 especially seem to contain enactments that must be included in any effective code that may be drawn up. The proportion of land allowed to each tenant appears to be 40 perches. The way in which the thing has worked may best be gathered from the owner's own words:—"I have no restriction as to rotation of crops, all my allotments are well cultivated, and, with about eighty here, I have never lost a rent, nor have I ever, in thirty-five years' experience, had occasion to dispossess a tenant for non-compliance with the rules. Potatoes, when the crop escapes disease, is the most profitable crop my people grow; but, as these require a change, they grow on one-half of their allotments usually. We are too distant here for any advantages of town requirements of (say) Cabbages, Carrots, &c. When Potatoes are not a failure, as has often of late years been the case, some have told me that their profits on their 40 poles, including all advantages, have returned them a profit of fifty shillings; but so far from a market for any produce, I believe this amount to be quite exceptional." This case, from its peculiar circumstances, is remarkably interesting, and throws much light upon what may be accomplished, even under every apparent disadvantage, when a desire to benefit the lower classes is combined with practical knowledge, and a firm, though light, governing hand. It illustrates particularly the great demand there is for allotment gardens, even in places where a pecuniary profit is not obtainable except under highly-favourable conditions. There is no market for vegetables, yet the allotments are sought after; and have been occupied for more than a generation. This conclusively proves that, in reckoning the advantages of the allotment system, the element of pecuniary profit must not be rated too highly, for the convenience and accommodation rendered by a constant supply of fresh vegetables is quite sufficient to repay both the rent and the labour expended on cultivation. The one great drawback to the utility of allotments in towns is found to be the constant petty thefts that are committed. Allotment gardens are peculiarly open to spoliation from the absence of fences and the nature of the crops grown, which cannot be identified as a rule. In a season when there happens to be a scarcity of green food, such as Cabbages, Carrots, Turnips, &c., a tenant who happens to have been fortunate, and has a fair share of these vegetables, is pretty certain to find them materially diminished during

the night. For this reason, some people have a predilection for planting Parsnips, whose roots take a firm hold of the earth, and are not easily stolen. Another unpleasantness which occupiers of allotment gardens in towns are always in dread of is the sale of the very ground under their feet for building purposes. Often the agreement upon which a tenant takes a garden is worded to the effect that such a sale shall be deemed an immediate termination of the letting, so that a tenant runs a chance of his crops being sacrificed to the inroads of bricks and mortar. Notwithstanding these drawbacks, there is a strong competition for allotments in all towns; and the difficulty experienced by the owners is not to find tenants, but to distribute the lots so as to arouse the least possible amount of jealousy and ill-feeling. The competition for these gardens is not, as might have been supposed, entirely among the poorer classes. On the contrary, the middle-class inhabitants are equally eager for the accommodation of a large kitchen garden; and there are few tradesmen in moderately-sized provincial towns who have not got allotments. This is, of course, exclusive of those who have private gardens of their own; but the number of these is comparatively few. If any one will take the trouble to visit the allotment gardens of a provincial town (some of these gardens extend to as much as 15 acres or more) he will find men there at work whom he would never have dreamt of seeing. They are at work, not from necessity, but out of that natural pleasure and delight which human nature feels in gardening. Here are gentlemen of good social position in middle-class life, tradesmen of considerable property, engaged in gathering Peas, sowing Carrots, or earthing Celery. The occupation is not looked upon in any way as degrading, or as a confession of poverty, but purely and simply as a healthy amusement, and a change from the confined atmosphere of the shop and counting-house. If this is the feeling among the fairly well-to-do, who are well supplied with all the comforts of life, how much stronger must it be in those who barely earn enough for the subsistence of themselves and families. The keen desire these poor people feel for an allotment is evident in the struggle they make to possess one. The very first question a man asks when he begins to work in a new place is, if he can get an allotment. If he can, he is satisfied. If not, he grows daily more discontented, as he marks the cost of the vegetables his family consume, and the scantiness of the supply upon the table. Beyond the mere economical part of the question, there undoubtedly exists, deep down in human nature, in the rudest as well as in the most refined, a delight in watching things grow; a pleasure in inserting the seed, and noting the first tiny green speck that appears. There is an undefined and almost holy joy in watching the development of life.

Effect of Allotments on the Labourer.

The use of an allotment appears to those who have resided among the agricultural poor to be productive of unmixed good. The labourer has then something which he can call his own; something which he can shape after his own heart. Brought up from his childhood amidst the operations of agriculture, he feels a natural desire to repeat the lessons he has learnt in natural economy on his own land and for his own benefit. Over and above the purely pecuniary side of the question, there rises up the even more important one of the labourer's own individuality. Too often that individuality is lost sight of, and he is considered as merely a cypher, an atom in a great concrete mass, as a soldier whose personal welfare is of little account so long as the army win the battle. But the real fact is—a fact which all thinkers must acknowledge—that the labourer is an individual, with a mind as well as a body, ideas as well as arms to work with. The very first step in the education of the man is to increase his individuality—to increase the sense of originality, so to say. In the operations of the farm he is merely a machine, for no work requires so little thought as ordinary agricultural labour. Give him an allotment garden and he becomes a human being whose powers are called into action. He has to calculate the proper amount of seed, to divide the area into proportionate patches of various vegetables, and to sow at the right season; to trim, and arrange, and all this by himself, and out of his own head, not in obedience to orders set before him. It is true that the amount of intelligence required is not great; but, without this aid, even that amount may lie dormant. The bodily comforts that arise from allotments cannot be disputed. Where children cannot get a full supply of rich and nutritious meat, and certainly our agricultural children do not get anything approaching to an adequate amount of animal food, the next best thing for them must be a bountiful share of vegetables. In point of fact, the quantity of vegetables consumed by a labourer's family is enormously large, especially of the three most favourite sorts, *i.e.*, Potatoes, Cabbage, and Onions. Cabbage is quite as extensive an article of food as the Potato, and the labourer makes few meals without an Onion. The Potato disease has been a terrible weight upon the poor, far heavier than the high price of coal or the rise of meat. The

Potato crop can now no longer be depended upon. It thus often happens that one-half of the allotment or garden fails to produce sufficient to pay the nominal rent, or to recompense the tenant for his labour. All possible expedients have been tried without success: the fatal fungus still makes its appearance—fatal indeed to the poor. This pest causes a tendency to cultivate Cabbages, which are therefore more largely grown than would otherwise be the case. Many say that the crop that pays them best is Onions. There is always a demand for them all the year round. Comparatively speaking, Carrots, Peas, and Beans, are of secondary importance. Turnips are great favourites, but require too large an area. How many a drunkard's family, whose head spent all his earnings in liquor, would have been starved had it not been for the produce of the allotment garden? When a man finally takes to selling the produce of his garden for drink, you may be sure that he has reached the lowest step of the ladder. The practice is unfortunately too common, and it is difficult to see how to prevent it. The price paid by the agricultural labourer for his allotment is usually very low. In some cases, where the land is poor, and the owner is the lord of the manor, it has been let at as little as 3d. per perch. The glebe-allotment alluded to previously, was let at 5d. per perch. The general run varies from 6d. to 1s. 6d. in crowded villages and small towns. In towns the rate rises with the ratio of the population, but is never so high as to impede the profits of cultivation. It is not necessary to enter upon an enumeration of the benefits which allotments confer upon the inhabitants of towns. The circumstances from which some little opposition has arisen to the allotment system, have been mainly the unfortunate relations which have lately existed between master and man; but it is to be hoped that no such disturbances will have the effect of depriving the labourer of this great necessary of his life.

Large Allotments Undesirable.

Another, and much more forcible objection, is that stated with some dogmatic energy, that the use of a large allotment ground tends to make a labourer an idle man. The argument appears paradoxical, but it has much more sense in it than may be imagined. A labourer becomes the tenant of a large piece of ground—say a quarter of an acre. He cultivates it, and really finds a profit from it. Over and above the vegetables eaten by his family, he is enabled to sell some surplus stock, and to pocket the profit in hard cash. He keeps a pig and fattens it upon the refuse. The sale of this pig places him in possession of several pounds, to him a large sum of money. So far so good. But now comes the mistake. If he is a man of some enterprise, and imbued with a desire to rise, or, what has much the same effect, is excited by avarice, he begins to make a very ancient and erroneous calculation. If a quarter of an acre will produce all these advantages, half an acre will produce twice as much; and an acre or two will even entirely support him. Filled with the idea, he takes an additional plot of ground, raising the extent of his holding perhaps to as much as 3 acres, and then his difficulties commence. In order to attend to this area properly, he is obliged to devote whole days to it, and sometimes a succession of days. The wages of these days are at once lost, and are to be reckoned as so much on the wrong side of the account. This intermittent attendance at work brings him into ill-odour with his employer; and finally ends with his renouncing regular work, and taking to do odd jobs, which bring in a precarious livelihood, and leave him without wages in the winter, when he wants them the most. Still, even now that he is master of his own time, he cannot properly attend to his miniature farm by himself. The weather steps in and impedes him. It may happen that a few days only are favourable to seeding, or to getting up; and, if these are lost, the season may be lost. His single arms and hands cannot do the work sufficiently fast. Then he has to call in aid, and to pay for that aid; and this goes to the Dr. account. Now he finds that while one pig was profitable, inasmuch as it costs nothing to keep, two or three require more food than the broken scraps his family leave. He must buy food for them if he wishes them to fatten. Here again the figure goes to the wrong side of the book. The pig, in fact, is the one thing about which a labourer might be naturally supposed to know most, and yet is the very thing upon which he commonly entertains the most exaggerated ideas. The real fact is, that the profit he derives from a pig is not made out of the pig itself, but because the pig acts as a savings' bank. He has to invest a few shillings to purchase it; that represents the original deposit. Then the scraps which would otherwise be wasted are consumed. Small sums that he would have wasted in drink are expended in the purchase of food for the pig; and presently when it is sold, lo! these unrecognised savings are returned, and the man is firmly convinced that he has been engaged in a most profitable transaction. If the money had been deposited in a savings' bank it would come to pretty much the same thing. Of course there really is a margin of profit, but very much

less than the enthusiastic labourer reckons; and he discovers this to his cost when he comes to keep two or three. In a very short time he finds that it is impossible to obtain a living from this small holding, and his thoughts are then turned towards the means by which he may augment his income. Perhaps he is a member of some religious body, and finds a friend who lends him a small sum of money, with which he purchases a cow. But here again he finds that the animal has a mouth. The produce of the garden is totally insufficient to support the cow any more than a number of pigs. He endeavours to supplement it by feeding the cow on the Grass at the roadside, but this is soon stopped by the police. Shortly the cow grows miserably poor; this decreases her milk. The calf is a wretched thing; it may die before it becomes saleable. He cannot afford to keep it long enough to get a really good price—sufficient to cover the previous loss of income through cessation of milk. It comes to much the same thing if he buys a horse instead of a cow, and tries hauling. The horse, never a good one, is brought down by lack of proper food to a skeleton, and becomes useless. It frequently happens that a farmer, struck by the persistent efforts of the man, will take pity upon him, and allow him to pasture the horse for nothing: and I have known instances where farmers have bought such men fresh horses when the old died from exhaustion and starvation. Yet somehow they never seem to prosper. The end is always the same—the land has to be given up, and the man returns to farm labour. There are to be found men in every village who get a living, and a fair living, by hauling, and these often have two or three small fields; but they do not pretend to make their income from gardening. It is the haulage which supports them, and there is only room for a very few haulers; so that it has become a common saying, that if you want to ruin a labourer give him a large garden. This arises from the over-estimate he draws of its capabilities. These facts do not militate against the general utility of allotments, but they do very strongly oppose the theory that land should be divided into small farms of 4 acres each, and that such a division would be favourable to the prosperity of the country. Imagine the picture that has been drawn, and which any person who likes can verify for himself; imagine this state of things prevailing over a wide extent of country. It has been calculated that a man can just support life upon the produce of 4 acres; but, as we have seen, what a life! liable at any moment to be disabled by an inclement season, for ever struggling with Nature for a hand to mouth existence. Surely no wealth, no flow of prosperity, could accrue to a nation thus employed. The reason of the wide-spread belief in the advantages to be derived from such a national system of allotment gardens, is the single assertion that the produce of a garden, well cultivated, is far greater than that of a field under the plough. It is pointed out that a labourer can pay so much per perch for an allotment, and yet make a good return; while the aggregate of the sums thus paid as rent are greater than the farmer gives, *i.e.*, an acre let out as allotment gardens returns more to the landlord than an acre rented by a farmer. This is certainly true, even in villages where land is not valuable, and very much more so in the neighbourhood of towns; but, upon examination, both these assertions, though based upon fact, cannot be used as arguments in favour of a national resort to the system, for the following very potent and very obvious reasons. The produce of a certain area cultivated as a garden is, indeed, greater than a similar area upon a farm; but the difference solely arises from the variety of the crops. Thus, it often happens that a labourer who has an allotment, after growing vegetables for a time, will sow Wheat as a change. Now, compare this Wheat with that grown in the adjacent corn field, and it will be found to be no better. In fact, Wheat is often produced by good farmers who use steam, or plough deep and do not spare manure, such as no allotment or garden ever brought forth yet. Then there must be taken into account the profits obtained and the benefit derived from the sheep and stock kept by a farmer. Every acre goes to assist in maintaining these. But it is impossible to maintain stock in allotment gardens; therefore the balance as to the produce of food for the people, both as regards Wheat and meat, is in favour of farms (especially large farms) and against allotments. It is well known that in Belgium a very large section of the population in one part obtain their living by the cultivation of plots of land very similar to our allotments, only considerably larger; but they cultivate many other plants besides those which are found in our gardens, as Colza, which they grow largely, and even Tobacco. A commercial element is here introduced into the question which is not present in England, and which is altogether separate from the problem of the production of food. The results, therefore, to which these considerations bring us appear to be:—Firstly, that the allotment system cannot be too widely extended, as a means of affording additional and varied food,

as a relaxation to the overworked, and as an influence acting in favour of general moral good. Secondly, that it cannot at present take the place of high steam cultivation, which is far more effectual an agent for the production of Wheat and meat. Thirdly, that any scheme by which the land would be divided into small plots or allotments must fail of its object, and would reduce the projectors to the condition of savages, or little better. Fourthly, that a plant requiring careful and minute attention, and bearing a high value in the commercial world, must be introduced before allotment gardens can become successful pecuniary speculations in a national sense. As regards the allotments themselves, some purely practical code of regulation is desirable.

Allotment Companies.

Numerous companies have been formed for the purpose of supplying the workmen with houses; the building societies and their estates are situated outside the city, but within easy reach by rail. Why should not societies exist and flourish, for the equally useful object of providing the workman with a garden? If the plan of universal division of land were thoroughly carried out, it follows that the cities would disappear, since, to obviate a bare living out of the 4 acres, a man must live on or very near to it, and spend his whole time in attending to it. But the extent of allotment-ground which such a society as this would provide for the workman must not be so large as to require any more attention than he could pay to it in the evening, or the Saturday afternoon, or, at most, in a day or so of absence from his work. He would have, of course, to go to his allotment by rail, and rail costs money. But how many thousands of workmen at this very hour go to their work day by day by rail, and return home at night? and the sum of money they thus expend must collectively be something enormous in the course of a year. To work his allotment he would have no necessity to visit it every day, or hardly every week. Such an allotment-ground must be under the direction of a proper staff of officers, for the distribution of lots, the collection of rent, the prevention of theft, and generally to maintain the necessary order. Looked at in this light, the extension of the allotment system to large towns does not hold out any very great difficulties. The political advantage which would accrue would be considerable, as a large section of the population would feel that one at least of their not altogether frivolous complaints was removed. As a pecuniary speculation, it is possible that such a society would pay as well as a building society, for the preliminary expenses would be so small in comparison. A building society has to erect blocks of houses before it can obtain any return; but merely to plough, and lay out a few fields in regular plots, and number them on a plan, is a light task. If the rent was not paid, the society could always seize the crops; and, if a plot was not cultivated in a given time, they might have a rule by which the title to it should be vacated. To carry the idea further, a small additional payment per annum might make the plot the tenant's own property. This would probably act as a very powerful inducement.—Abridged from the "New Quarterly Review."

TOUGHENED GLASS.

ALTHOUGH the manufacture of glass has been carried on for about 2,000 years, it does not appear that any attempts to overcome its inherent brittleness and liability to fracture, and at the same time to preserve its transparency, have proved successful—if, indeed, they have ever been made, which is doubtful. It is true that the French philosopher Réaumur many years since hardened glass somewhat by exposing it to a high temperature for a considerable time. But this process which is technically termed devitrification, while it hardens, at the same time crystallizes the glass and renders it opaque, the product being known as Réaumur's porcelain. Seven years since, however, M. François de la Bastie, a French engineer, discovered a simple means of rendering glass practically unbreakable, and at the same time of preserving its transparency. There were many delicate conditions involved in the process by which he obtained this result; and on endeavouring to repeat the successful experiment he failed signally. For two years more he strove without avail to re-discover the secret of his success. At length, however, he succeeded in so doing, and has since been engaged in perfecting his invention and in developing a laboratory experiment into practical working. The process of conversion in the main is a very simple one, so simple that it seems singular it was never thought of before. Broadly stated, it consists in heating the glass to a certain temperature and plunging it while hot into a bath consisting of a heated oleaginous compound. To the efficiency of this process, says the "Times," we can testify from the inspection of a number of toughened glass articles at the offices of Messrs. Rey, 29, Mincing Lane, the representatives of M. de la Bastie in England. In these articles, which consisted of watch-glasses, plates, dishes, and sheet glass, both

coloured and plain, neither transparency nor colour is affected at all, and the ring or sound only slightly. These articles, some of them being exceedingly thin—were thrown indiscriminately across a room against a wall and fell spinning on the deal floor. Water was boiled in a saucer over a fire, and the saucer was quickly removed to a comparatively cold place, and was unaffected by the sudden change of temperature. One corner of a piece of glass was held by the hand in a gas flame until the corner became exceedingly hot, but the heat was not communicated to the other portion of the glass, neither was it cracked from unequal expansion. A comparative experiment was then made with a piece of ordinary plate glass, and a similar piece of toughened glass, in order to show their respective powers of resistance to fracture, from the force of impact by a falling weight. In each case the glass was about 6 inches square, and was placed in a frame, the weight being dropped upon its centre. With the ordinary glass, a 2-oz. brass weight falling on it from a height of 12 and 18 inches respectively did no damage, but at 24 inches the glass was broken into several fragments. With a thinner piece of toughened glass no impression was made by the same weight, falling from heights ranging from 2 to 10 feet, the weight simply rebounding from off the glass. An 8-oz. iron weight, tried at 2 and 4 feet respectively, gave similar results. Upon the height being increased to 6 feet, however, the glass broke. But here another singular result was produced; instead of breaking into about a dozen pieces, as did the ordinary glass, it was literally smashed to atoms. The largest fragments measured about half an inch in length and breadth, and these were easily reduced by the fingers to atoms varying in size from that of a pin's point to that of a large pin's head. The lines of fractures in the fragments presented to the eye the appearance of irregular lace-work, and these lines were, moreover, apparent to the touch, but more palpably so on one side of the glass than on the other. Which of the two sides was the one that received the first impact of the blow we were unable to determine. Another peculiarity is that the edges of the fractures are by no means so sharp, and therefore capable of causing incised wounds, as are those of ordinary glass. It would seem that the toughened glass possesses enormous cohesive power, but that if the equilibrium of the mass is disturbed at any one point the disturbance or disintegration instantly extends throughout the whole piece, the atoms no longer possessing the power of cohesion. Of the practical character of M. de la Bastie's discovery there can be no question whatever, nor can there be any doubt of its value. The applications which suggest themselves are innumerable, but for the present there remains one purpose to which toughened glass cannot be so easily applied, and that is to window glazing in odd sizes, inasmuch as it cannot be cut by a diamond or other ordinary means. Our glaziers will therefore have a respite, but we cannot give them much hope that it will prove a long one, as experiments of considerable promise are being conducted with the view of solving this problem. Moreover, the glass can be cut to the proper sizes before toughening if desirable.

WHAT WILL THE GLAZIERS SAY?

"LET all in vitreous tenements who dwell"
(Tupper, an old saw set in a new strain)
"Forbear the flinty missile to propel."
Proverbial wisdom-teachers must explain
Hereafter, when Brown, Robinson, and Jones,
May in glass houses live, and yet throw stones.
Paterfamilias, look what hope appears!
Thou, as of old, will be distressed no more
With jingle, too familiar to thine ears,
Of glass or tumbler dashed on kitchen floor;
And windows smashed by boys who roam,
Or thine own idle brats at home.
Thy casements shard and pebble will defy,
Nay, taws from "catapults" let fly.
Thy tumblers will stand falls, decanters flinging.
If guests should ever bottles shy.
Yet toughness hinders not hard glass from ringing,
With unimpaired sonority of tone:
Glass bells in steeples soon will chime,
Big Bells, perhaps, in no long time
Instead of being founded will be blown.
What may posterity not make?
Cannon perhaps, fortifications,
Out of a glass no common force can break;
Our "Alexandras" and our "Devastations"
And "Minotaurs," "my lords," in future days,
Instead of plating, possibly will glaze. —"Punch."

THIS is the season when the editor shouts up the pipe to the printer, "The poem sent up yesterday, headed, 'Spring is Come,' you can keep over for another week."

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Kitchen Garden.—Where Chicory is held in estimation as a salad plant a little of the seed should now be sown in rows, 12 or 14 inches apart; drop a few seeds at intervals a foot asunder in the rows, and, when up, thin the plants out to one in each place. By thus giving them room enough the roots acquire double the strength which they attain when grown thickly; one good plant produced in that way will furnish as many leaves fit for use as three small ones. All the attention required afterwards through the summer is to keep the hoe going sufficiently to destroy weeds as they make their appearance. Of Chervil a little should now be sown thinly on well-prepared soil, and covered lightly. Rampion, Salsafy, and Scorzonera, may all be sown towards the end of the month, in rows, 14 inches apart, putting the seeds in thinly, and still further thinning the plants if too close when up. Through the summer keep the surface well stirred with the hoe. For mere appearance sake, to make the ground smooth, the rake is often used immediately after the hoe; but, amongst culinary vegetables, this need never be done, unless it is necessary to remove weeds that have got much larger than they ought to have been allowed to grow before the hoe was used. Ground raked smoothly when wet becomes hard and baked, and, when dry weather sets in, loses moisture by evaporation much faster than that which is loose and open for an inch or two deep, a condition that also best befits it for absorbing the falling rains. By frequent surface stirrings, too, the crops get the full benefit of any manure that may have been applied, instead of helping to support, as it often does, a vigorous weed growth.

Pits and Frames.—A good substantial hotbed should now be prepared to receive the Melons sown a short time back; this should be made of well prepared dung and leaves, and, when finished, should be 4 feet 6 inches high, and should extend beyond the frame half a yard on all sides. Slight beds for either Melons or Cucumbers are useless until further on in the season, when the weather is warmer; for, whilst the nights are yet cold, they require so much labour in replenishing the linings with fresh manure. As Cucumber plants get strong they will require more water both at the root and overhead. Syringing should be attended to early in the afternoons, whilst the sun is yet warm, always using tepid water, both for this and for watering; 90° is a safe temperature at which to use it, and, if the heat of the bed is at all declining, water at this temperature will in some measure assist it. When the shoots of Dahlias get from 3 to 4 inches long they should be taken off at the lowest joint, and put singly in small pots, in half loam and sand, plunging them in a bottom-heat of 80°, and keeping the soil moderately moist but not too wet. Tomatoes, as soon as large enough to handle, should be shifted from the seed-pans into 48-sized pots, placing two plants in each; keep them in a growing temperature and near the glass. If autumn-struck bedding Pelargoniums are yet thickly together in the pots in which they have been wintered, they should at once be potted singly in small pots, giving them half loam and half leaf-soil, with a little sand; place them for a fortnight where they will receive a little warmth, in order to induce them to grow, after which they should be gradually hardened off in cold frames. Verbenas, Heliotropes, Lobelias, Ageratums, and all similar bedding plants, should, as they become rooted, be placed in small pots, singly, or in boxes 3 inches apart each way. Boxes are best, as the plants grow until bedding-out time much better than in pots, and there is also in this method of treating them, a great saving in the labour of watering; nip the points out to make them bushy, and make careful examination for aphides, Verbenas being especially subject to them; fumigate, or syringe with tobacco-water, on the first appearance of these pests, or they will quickly spoil the plants. See that Calceolarias are not too much crowded, and that they are well supplied with water; if they suffer for want of moisture at the roots, they get into a hard stunted condition, and will never afterwards grow freely, but will more frequently go off the first dry weather that occurs after they are planted out. Alternantheras, Iresines, and Coleus should be kept in a growing temperature, as there will still be plenty of time to harden them before the time comes for planting them out; if put out too soon, they get chilled, and do little good. Sedums, Sempervivums, Echeverias, and Centaureas should be kept where they will receive plenty of light and air every day, so as to induce a stout robust growth. Such sub-tropical plants as Cannas, Solanums, Wigandias, Chamæpence, and Humea elegans, should be well attended to; these are free-growing subjects, and, if allowed to become pot-pound, some time must elapse before they move freely after being planted out. Golden Pyrethrum, variegated Arabis, Golden Thyme, and similar plants, may, with advantage, be at once planted out in the places they are to occupy, if the beds are at liberty; this will be so much done when the time for a general planting out arrives, and the plants will thus be getting gradually esta-

blished, and be rendered sooner effective. Where sub-tropical plants are grown, two of the best and most distinct for standing side by side, and forming an effective contrast, are *Acacia lophantha* and *Ficus elastica*. These should be largely employed, for, even if the season should happen to be unfavourable for this class of plants, these two never have the forlorn appearance that some subjects have. Nor should the old *Ricinus communis* (Castor-oil plant) be lost sight of; it looks well in any situation where it is not too much exposed to the action of wind.

Houses.—Camellias will now be making their growth, and must be well supplied with water at the roots, and also syringed overhead freely. Many amateurs do not succeed well with these plants, which get into a yellow unhealthy condition, in which state they make little growth and few flowers, and, where such is the case, although they will bear a deal of bad treatment without dying outright, it is a somewhat difficult matter to bring them round. One of the principal causes of this state of things is often attributable to their receiving an insufficiency of water, especially whilst making their growth. At no season, however, will the Camellia bear getting too dry, the large amount of leaf surface which the plant possesses causing the moisture to evaporate with great rapidity. Moisture must be supplied through the roots, which, if in too dry a condition, fail to perform the work required of them. Camellias are, in this country, most generally grown in loam, but for amateurs who are not thoroughly skilled in their cultivation, I should recommend peat as the better material to use. This being more retentive of moisture, is more likely to prevent the ill effects of drought. It is not advisable to pot Camellias at the present season, unless they are suffering seriously for want of root-room. Moving them now is sure to interfere, more or less with their flowering; if it be absolutely necessary, avoid as much as possible interference with the roots. In potting, whether the soil used be loam or peat, add as much sand as will keep it from getting sour, especially as it is necessary to ram the new soil so as to make it as close as the existing ball of the plant, otherwise the water afterwards given will escape through the new soil. Whilst making growth, shade is indispensable. Attend carefully to plants that are intended for summer flowering. Large Fuchsias should be supplied with a stout central stake to support them, and the shoots should be stopped, so far as is required, to furnish the plants, and give them, when in flower, a dense well-furnished appearance. If in small pots, the application of weak liquid manure once a week, will assist them, but for these plants it must not be overstrong or it may have the effect of causing both the advancing flowers and leaves to fall off. Young Fuchsias that have been struck during the autumn and winter should be moved into their flowering pots. These plants will succeed the larger ones in blooming. Petunias should be kept stopped so as to make them bushy. These, especially the double kinds, are useful for summer flowering, as they continue to bloom for a length of time after flowers are scarce. Azaleas now in flower will require shading from the sun, and this is also the case with Cinerarias, Amaryllis, Acacias, *Cytisus racemosus*, *Hortensias*, *Deutzias*, and other similar plants. Roses in pots that have been for some time in a greenhouse temperature will now be pushing their flower-buds. Do not place them near the front lights, as a cold current of air upon the young tender leaves is favourable to the development of mildew. Assist them with manure-water every alternate time they require watering, and, if aphides make their appearance, fumigate at once. Amongst a general collection of plants at this season, this is a matter that requires constant attention. Slight and frequent fumigations are much the best; but if two or three gallons of tobacco-water be kept at hand in a vessel, so that any small plants that are affected can be dipped, and larger ones syringed, a considerable saving of both labour and material in fumigation will be effected, and the disagreeable smell of the tobacco be avoided. Where means exist for forcing flowers in winter, provision should at once be made to have the necessary plants coming on for the purpose. *Epacris*, *Acacia Drummondii*, *Cyclamens*, *Genistas*, *Abutilons*, *Bouvardias*, *Epiphyllums*, *Correas*, *Myrtles*, *Monochaetums*, and the Sweet-scented *Daphne indica*, if encouraged to make their growth early in the summer, and their wood is well ripened in the autumn, can, with a little heat, be brought into flower through the winter and early spring months.

Rewards for Wasp Catching.—If horticulturists and others interested in gardening would combine and offer small rewards for the capture of wasps at this season, it would have the effect of reducing their numbers—a most desirable result; for, in spite of all that Sir John Lubbock may advance to the contrary, wasps are perhaps the most mischievous and malicious pests with which gardeners have to contend. For years past my practice has been to give a penny each for wasps from Christmas to the 1st of June; our village children are, therefore, keenly alive to the importance of catching them. I may add that I killed the first wasp which I have seen this year on the 24th ult.—WINCHMORE.

THE KITCHEN GARDEN.

SEAKALE GATHERED ON THE HAMPSHIRE COAST.

BETWEEN Calshot Castle and Leap wild Seakale grows luxuriantly on the beach, just above high-water mark, and those who live close to the shore claim so much of it as is opposite their domain. In autumn, when the stems die down, they cover each stool with shingle, to the depth of 18 inches or 2 feet, an operation which answers two purposes—it keeps the crown from being trodden under foot in winter, and when the Kale commences to grow in spring it blanches it. It is generally fit to cut about the middle of March, but this season, like other vegetables in this locality, it is a month later than usual. A good harvest is made of it when fit to cut, which is just before it peeps through the shingle. The latter is carefully removed by the hand, so as not to break the tender stalks, which turn out quite clean and well blanched. When cut it is sent to Southampton and Cowes, where it finds a ready market at 6d. per lb. Although all the crowns are covered at the same time they do not all come in at one time; we commenced cutting on the 1st of this month, and to-day (April 12th) I have examined some of the heaps and find the crowns only just commencing to grow; cutting generally lasts three weeks. I see no reason why Seakale should not be grown on the coast everywhere, that is, where any space is left above high-water for its accommodation, for it would doubtless grow on other parts of our shore as well as here and at Whitby, where I have seen it cultivated. I would advise all who live in the neighbourhood of our seaport towns where any beach exists above high-water mark, to sow some seed in the following manner.—With a shovel open a trench a foot deep, if shingly; but, if sandy, half that depth will do; sow the seed in it as you would Peas; then fill it up, which is all that is necessary until the roots are large enough to be transplanted, which, if the seed be sown in March, will be in the succeeding March. Take the roots up as carefully as possible, and plant them in fours in squares 9 inches apart and 3 feet asunder between the squares, which, if in lines, should be 6 feet distant from one another. When covering the crowns for blanching the shingle may be heaped up over them in ridges along the lines.

W. W. EAGLEHURST.

[Along with this came samples of the Kale in question which was well blanched, stout in growth, and in every way, excellent; and, when cooked, the flavour was even more delicate than that of ordinary forced Seakale. Our correspondent informs us that its growth is not so strong this season as it is in general; last year it produced stems about 9 inches long, each of which weighed a pound, and some 20 ounces.]

CORKLESS BOTTLES GOOD BIRD-SCARERS.

SOME years ago, I found the small birds unusually daring in defying the feathers and kite-tails placed as a guard over the Broccoli seed beds. The crop had been pretty well cleared by them on three successive mornings, when I happened to meet an old man, who I knew was an experienced gardener, and to him I stated my case, and asked him if he knew of any easily-applied remedy. "Did you ever try bottles, sir? But you must not put corks in them." "No, I will not put corks in them," I replied; "and now tell me all about it." He then directed me to place a dozen clean empty wine bottles at equal distances over the beds. I did so, and the very next morning there appeared above the ground what remained of the seed, in sufficient quantities to supply my garden, so that I did not find it necessary to raise any more plants. This remedy is not always successful. I found it did not keep the birds off the later Pea crops, and I attribute its partial failure at other times to the bottles being left on the ground after the plants are safe, and the birds have recovered from the fright occasioned them by the bottles, so that when the latter, after standing on the ground a month, are merely shifted to a new situation a little further off, they have not the same effect as they had in their former position. Again, when much pressed by hunger, or greatly tempted by the sight of what they like, birds will face any sort of scaring material, and nothing but netting or some such protection will keep them off. Bits of tin, glass, and coloured streamers, availed nothing to deter that worst of all garden pests, the bullfinch, from clearing off in a few hours nearly all the bloom buds of a fine young pyramid of the Apple called Cox's Pomona the year before last; and last year I only saved a portion of the crop by covering

the whole tree with a net. While on this subject I may mention that for Peas I have found the following an easy and a successful protection, applied just before they appear above the ground. Two pieces of slater's lath about a foot long, with a hole at each end made with a half-inch centre-bit, and with about a dozen copper nails driven into one side and standing up about half-an-inch, are secured by means of pegs driven into the ground through the holes, one at each end of the row; then a ball of fine twine is wound off along the rows and across the nails backwards and forwards till the ground is pretty well protected by the twine. In a fortnight or so the twine can be unwound and the laths removed to a succeeding crop. A few sticks should be laid across the rows at intervals to keep the twine an inch or thereabouts above the ground.

B. S.

The Golden Trophy Tomato.—This new and beautiful yellow Tomato originated in 1871, with Mr. A. M. Halstead, an experienced American horticulturist. It is a sport from the well-known Trophy, but is a stronger and more rapid grower, is much more productive, and ripens a week earlier, continuing until frost. The fruit is almost an exact counterpart of the Trophy in form and size, of a beautiful light yellow or straw colour, occasionally faintly streaked with red; the flesh is very firm and solid, containing but few seeds. Its flavour is entirely different from any variety with which we are acquainted, being free from the strong Tomato taste and fragrance which belongs to most other varieties; has very little acidity, and when eaten raw without seasoning, resembles in flavour some varieties of Apples. This, which is described in Mr. Bliss's catalogue, appears to resemble in flavour the yellow Tomato shown by Messrs. Carter last season.

New Potatoes in the Open Ground in January.—I have been informed that Mr. Gilbert, of Burghley, and others living in that locality, are in the habit of taking up large quantities of new Potatoes from the open ground in January. If I understand aright, the method pursued is as follows. Plant in July, and upon the approach of frosty weather cut off all haulm, and cover up the rows with dry leaves or litter. Now, if this be so, perhaps Mr. Gilbert, or some of his neighbours, who have practically tested the scheme, will not object to give, in the columns of THE GARDEN, their experience in this, to me, very important matter. I have tried the experiment myself on a small scale, but with most disastrous results. I found that as soon as our autumn rains set in, the disease attacked the young and tender haulm in so virulent a manner, that when I dug for my anxiously looked for new Potatoes at Christmas, not a single sound tuber could be found. Possibly Mr. Gilbert's success, if successful he has been, is owing to some peculiarity of soil or climate.—B. CALVERT, *Terlings, Harlow.*

Trial of Dwarf Forcing French Beans.—Of selected Syon House Dwarf Bean, sown on the 1st of January last, I gathered the first pods on February 18, the length of the pods being $4\frac{3}{4}$ inches, whilst Sir Joseph Paxton Dwarf Bean, sown on the same day as the Syon House, did not produce pods fit for use till February 22; but its pods measured $5\frac{1}{4}$ inches, and were of a beautiful shade of green. From Osborn's Forcing Dwarf Bean, sown on the same day as the above, I gathered the first pods on February 22, as in the case of Sir Joseph Paxton; the length of its pods was 3 inches. Canadian Wonder, sown on the 1st of January, was a failure; with me it is a late Bean, a strong grower, and not adapted for pot culture. The variety which I grow under this name is of the red Flageolet type, and one of the best for out-of-door culture. Selected Syon House—which, as will be seen, was four days earlier than either Sir Joseph Paxton or Osborn's Forcing—is a good cropper; but its pods are not so long as those of the two just named. Of Sir Joseph Paxton and Osborn's Forcing, I give the preference to Sir Joseph, both as regards length and colour of pods. Both are good croppers.—DAVID LUMSDEN, *Bloxholm Hall Garden, Sleaford.*

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

The Red-skinned Flour-ball Potato.—Much has been written in favour of this Potato. I have grown it for several years, both in fields and in the garden, and in various soils; but I have in all cases found it when cooked to be of very inferior quality, and certainly not less subject to disease than Victoria and other superior sorts. I have, therefore, now finally discarded it.—J. BELL, *Strathfieldsaye.*

Rollisson's Telegraph Cucumber.—Mr. Gilbert I see considers this the best winter Cucumber; in my opinion it is also the best summer variety. I planted it on the 6th March, last year, in a span-roofed house, 19 feet 6 inches by 10 feet, which is not sufficiently heated for planting earlier. I began to cut on the 30th April, and during the season 827 fruits were registered as taken off the plants by my foreman, several more being cut by myself which I omitted to put down. The fruits were fine and handsome, many of them fit for exhibition, the sort being quite true to name, as I had it from Messrs. Rollisson some years since. Will not this bear comparison with any of the new varieties?—JOHN GARLAND, *Killerton, Exeter.*

ORCHIDS AT STEVENS'S.

THE holders of collections of Orchids used to look aghast in time past at the increasing importations of them from both the Old and the New World; they, in fact, anticipated a downfall of value in the then existing stocks such as has never been realised; for, as fast as one cultivator fell out of the ranks, as the sequel has shown, two were always ready to take his place. The taste for Orchids, however, was never so pronounced, at least, so far as my knowledge carries me, as at Stevens's the other day (April 8th). On that occasion a tempting catalogue was issued, announcing, among other things, the sale of *Dendrobium Wardianum* and *D. Falconeri* in such masses as people never dreamt of, and the consequence was a crowd of buyers from most parts of the United Kingdom, and accordingly a brisk sale. An outsider who does not understand much about plants would have scarcely gathered the lot together, so desiccated and dying-like would they have appeared to his untutored eye, and yet that heterogeneous mass realised no less than between £1,400 and £1,500, by far the largest sum, perhaps, ever realised for imported Orchids in one day. How that money mounted up will surprise nobody when it is stated that one plant alone realised the handsome sum of 100 guineas. Growers and others well acquainted with Orchids were speculating what that plant would bring; some thought it would scarcely fetch twenty guineas; few, if any, supposed it would double that sum, but the bidding, which began at twenty guineas, went up first in fives, then in tens, then in fives, until it was knocked down—after a spirited competition between Mr. Wrigley, of Manchester, and Lord Londesborough—to the latter at the sum just named, viz., 100 guineas. We have scarcely a word to say about the value, for a plant or anything else is said to be worth just what it will bring, and no more; only this, we may be safe in saying that no nurseryman could have obtained that sum for it privately. Many of the lots of the same kind were disposed of, all at fair prices, and numerous others are catalogued for this week, which, in all likelihood, will bring good prices. The species in question comes from a new locality, and is undoubtedly distinct from, although closely allied to, *D. Wardianum*. The chief feature of the latter is that it emits its long whip-like pseudo-bulbs in an undulating fashion, differing both from the species sold in that respect, and from *D. Boxallii*, another excellent *Dendrobe*. Moreover, it appears to me that there is also either a vast dissimilarity among the pseudo-bulbs, as taken from their native habitat, or two distinct species are co-mingled one with another. The striking plumpness of the one, almost concealing the nodation, which catches the practical eye in discerning between one thing and another, is conspicuous in comparison with the purely cylindrical form of the other, which, albeit, is more conspicuous for "swelling at the joints." The flower, too, which Mr. Low showed me, is possibly more decided in the yellow of its labellum, which, of course, is no botanical distinction, but is nevertheless one which has weight with gardeners; besides the form of the labellum is not so convolute, nor is the flower so large; but, then, the number of flowers on the pseudo-bulbs, and their free formation, point out at once that we have either a vastly-improved habited *Wardianum*, or a distinct species. However, be it similar or dissimilar to any existing species, it is doubtless a very excellent *Dendrobe*, and it is to be hoped that more of it will be forthcoming some day. The plants of *D. Falconeri*, from the same habitat, were excellent; indeed, they reminded me of the vegetation of some bygone epoch; and it is to be hoped that our Orchid growers will be able to maintain the stamina and development of flowers which such luxuriance ought to ensure. After all, cool Orchids do not maintain an isolated supremacy. There is room yet for good things, and plenty of them too, no matter from what quarter of the globe they come.

JAMES ANDERSON.

Meadowbank Nurseries, Uddingston, N.B.

Cutting Timber during a Shooting Lease.—An appeal case was brought before the Lords Justices at the Court of Chancery, the other day, which raised a rather interesting question as to whether a person who has hired the right of shooting over an estate has the power of preventing his landlord from cutting down trees on the estate. It appears that in October last, the Rev. Henry de Foe Baker, the defendant in the present suit, agreed to let to Mr. John Gearn, the plaintiff, for a lease of twenty-one years, the mansion of Syrencot, Wiltshire, "together with the exclusive right of shooting, coursing, and fishing, over 1,300 acres, situated in the parish of Figheldean, Wiltshire, at the yearly rent of £125." On the 29th January last, the defendant caused to be put up for sale a quantity of timber on the estate, and the plaintiff alleged that the cutting down and the pulling up of this timber would involve the utter destruction of five of the plantations on the estate as covert for game. It was urged by the plaintiff that this would be in direct contravention of the spirit

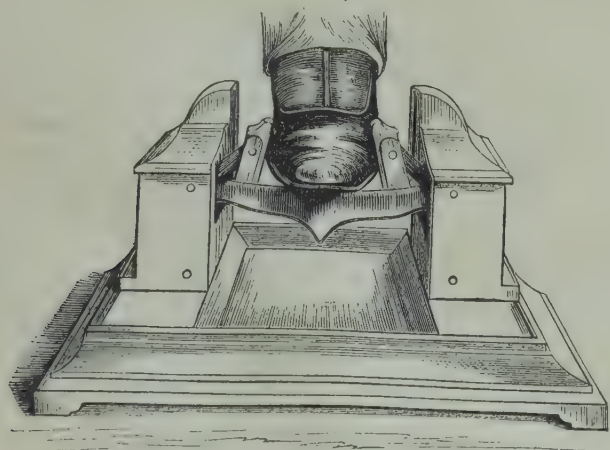
and effect of the agreement. The bill sought an injunction to restrain the defendant from cutting down any trees in the coppices, woods, plantations, and belts on the estate. This injunction Vice-Chancellor Hall granted on the 18th ult., reserving liberty to the defendant to apply in chambers as to the cutting of any trees which had been sold but not yet felled. The defendant now appealed. Lord Justice James was of opinion that, with all respect to the Vice-Chancellor, the injunction which had been improvidently granted must be dissolved. Lord Justice Mellish was of the same opinion, remarking that "the right of shooting was a right to shoot over the estate in its proper condition of management, and the landlord did not, by such an agreement, deprive himself of the power of managing his estate in the way he might think best."

Explosions of Gas under Boilers.—"N. H. P.'s" complaint (see p. 292) reminded me of similar cases which have come under my own observation, one of which was in a dome or round-topped independent cylinder boiler, in which the outlet for the smoke was at the side, about 9 inches below the top of the boiler, thus leaving a cavity where the gas thrown off by the banked-up fire collected, till a tongue of flame broke through and fired it, causing a violent explosion. Were the building of the saddle boiler referred to by "N. H. P." examined, I have little doubt but that the flues will be found to go off low down at the back of the furnace, and that the upper part of the arch of the saddle, being built across at the back, will form a receptacle for gases, so that, when the fire is banked up for the night, and the furnace and ash-pit doors are shut, leaving no draught to carry away the gas generated by the smothered fire, it necessarily gathers under the arch of the boiler, until the flame comes through and it explodes. The only way to prevent this is to allow sufficient draught to carry it into the chimney, or to have the flues so constructed that the gas will find an egress at the highest point, and so pass up the chimney as fast as it is generated. No fire will burn without a sufficient supply of air to carry off the products of combustion, and many stokers err in the excessive use of dampers, &c., to stop all draughts, and so often put out their fires altogether.—AQUA-CALIDA.

The Tea Plant in Sicily.—An interesting experiment is about to be made in Sicily. A great similarity has been observed to exist between the soil and climate of Sicily and Japan, and this has encouraged the Italian Government to make trial of growing the Tea plant in the former island. Seeds and full directions for culture have been obtained through the Japanese consul, and the result of the experiment is awaited with some anxiety; Spain and Greece being similarly situated as regards latitude and climatic conditions, and so equally interested in the success of the scheme.—"Academy."

AN IMPROVED SCRAPER.

A SCRAPER, which it will be admitted is a great improvement upon the old-fashioned kinds, has been sent to us for trial, and proves in every way satisfactory. As will be seen from the accompanying



engraving, it is intended to scrape the sides as well as the bottom of the boot, two side-pieces starting out for that purpose upon the pressure of the sole of the foot, and, by means of balance weights, returning to their places as soon as the pressure is removed. This scraper, which is called the improved unique patent boot-scraper, is the invention of Mr. G. Pewett, of Highbury Place, Bath.

The Gum Tree not Hardy.—"L'Italie," a paper published in Rome, says that of 3,000 trees of the *Eucalyptus globulus*, planted at San Sisto Vecchia by the municipal government, none are in a flourishing condition; and of all those planted along the line of the railroad between Rome and Naples, only those near Naples are living. It is almost certain, says "L'Italie," that *Eucalyptus globulus* will not grow in a temperature which falls below 27°. Trees exist occasionally with us, but they never show a trace of the beauty they do in countries sufficiently warm for them.

NOTES AND QUESTIONS—VARIOUS.

Apricot Branches Dying.—Mr. Gilbert's advice upon this subject (see p. 295) is, doubtless, good; but, when the seedlings are raised, would they be of any value? Does not the seed produce, as a rule, fruit inferior to that of the parent?—A. D.

Variegated Common Laurel.—This we cultivate in our Nurseries. In some soils it retains its creamy markings well, but in rich alluvial soils it often, I may say generally, reverts to the normal green colour. Peat soils generally preserve variegation better than any other.—J. SCOTT, Merriott.

Maranta tubispatha.—Can you tell me whether or not this dies down in winter?—K. [Yes; it belongs to the deciduous section of Marantas, and, therefore, naturally dies down in winter.—B.]

Victoria Regina Violet.—Another year's experience of this fine Violet enables us to recommend it with confidence as one of the largest, hardiest, and sweetest Violets in cultivation; almost as long-stalked as the Czar, and decidedly sweeter.—"Villa Gardener."

Brugmansia lutea.—There is now in flower in the conservatory at Hatfield House a magnificent plant of this rather scarce Brugmansia. It is in the finest possible health, and its bright yellow flowers contrast well with the dark green foliage. It is a plant worthy of extensive cultivation.—E. BENNETT.

Earliness of the Pink Primrose.—Many are not aware of the earliness of the coloured varieties of the common Primula over those of the common pale forms. In early spring several of these are in flower in the worst kind of weather. This season the pink varieties have been in flower in March, while the common yellow are hardly open in April.—"Villa Gardener."

Aubrietia Eyerii.—This fine variety, exhibited by me the other day at South Kensington, was raised by Mr. Stuart, gardener to Mrs. Eyre Crabbe, of Glen Eyre, Southampton. It is a robust growing kind, and has larger flowers than those of *Aubrietia græca*, and of a much deeper hue of colour than that of *Campbellii*; indeed, they are richly shaded with violet, and, as it is a free bloomer, it makes a beautiful spring bedding plant.—A. DEAN.

Retinospora plumosa Indoors.—Among the eight or nine kinds of *Retinospora* with which I am acquainted, this is perhaps the most beautiful, and being slender and graceful in growth, it is well adapted for conservatory or hall decoration. Indeed, more Coniferous plants, when grown in pots or tubs, are suitable for this kind of work than many imagine.—J. MURR.

Button-hole Flowers.—Some of the small white-flowered Narcissi, especially *N. papyraceus* or "Paper white," look well mixed with the lovely blue *Scilla sibirica* and a bit of any fresh green Fern. *Boronia serrulata* is one of the best of all bright rosy-coloured flowers now available for such bouquets; its little tufts of four or five tiny flowers are admirably adapted for grouping along with white Hyacinth pips or with a small white Tea Rose.—B.

Hardiness of Selaginella denticulata variegata.—This is equally as hardy as the green form. It possesses the peculiarity of entirely changing to a silvery whiteness in a perfectly cool house in winter. A long line of it, in a north house here, where frost is barely excluded, forms an edging to a Fern stage, and has this winter been very striking. In summer, it becomes green all but the very tips of the young growth, but changes again to white with the decrease of temperature.—W. D. C.

Shaking the Dead Flowers off Camellia Plants.—The practice of shaking plants, in order to dislodge unsightly or falling flowers, is very often carried too far, and is the cause of much damage. A well-laden Camellia, for example, covered with hundreds of splendid blooms, is often treated so roughly in this way that, in getting rid of the fading flowers, quite as many of those that are still perfect are injured, and many a plant in full flower is prematurely shaken out of bloom. Moreover, when a cut flower is required, the choice generally lies between a bruised one and a newly-opened bud.—CHEVALIER.

Propagation of Coprosma Baueriana variegata.—Now is a good time to obtain a stock of this fine-foliaged plant, as old plants of it will now be making young shoots, which I have always found to root most freely. I take the young tender tops about 2 inches long, cut them immediately beneath a joint, and insert them thickly in ordinary propagating-pans, well drained, and filled with a light sandy compost. I then place them in a bottom-heat of about 80°, and keep them close, shading when required; and I have never been disappointed with the result.—E. G. OTTEWELL.

Training Camellias.—This is a great mistake. The desire of young gardeners to have a large plant in as short a period as possible is no doubt the cause of the mis-shapen plants that are so frequently met with. I maintain that pruning, and not tying, is the most natural way of producing finely shaped plants; and, no matter what age the Camellia, this operation should be performed; every healthy strong shoot should be shortened, and the weak ones cut out. In eight places out of ten, if you don't find Camellias lean and lanky, you find them deformed and twisted into all sorts of shapes.—CHEVALIER.

Arrangement of Cut Flowers.—I saw the other day a device in this way, so simple and pretty that I made a note of it. It consisted of a circular piece of cork 6 inches in diameter, and a quarter of an inch thick, perforated with holes like the hose of a watering-pot. Into these the flowers were neatly arranged, and the cork floated in a saucer of water, where it formed a pretty object in the centre of a small table. For small flowers with delicate stalks, this plan answers well, and also where a low flat system of table decoration is required. Let me add that, for table decoration, the beautiful *Primula cortusoides amena*, when grown as a pot plant, does well.—OBSERVER.

Dendrobium fimbriatum.—When well grown this is one of the most ornamental of all spring-blooming yellow or orange-flowered Indian Orchids. A plant of it at Abney Hall, Cheadle, is just now furnished with fifty spikes, most of them bearing nine or ten flowers each, and some few even more. The crimson-blotched variety *D. fimbriatum oculatum* (*D. Paxtonii* of gardens) is even more beautiful than the species, because it possesses greater variety in colour. Both plants grow well in an ordinary plant stove, and under ordinary cultural skill seldom fail to bloom well. A plant of the crimson-blotched variety, bearing fifty or sixty spikes of bloom, was shown the other day at the Regent's Park exhibition.

Ixora-root Insects.—I have just lost a very fine *Ixora*, and find the roots a mass of warts, in some of which there is a small white egg. How is this to be avoided in future?—J. F. W., Henwick Grange, Worcester. [This is new to us. The galls are of the same character as those on Pea roots, but quite distinct, and the first step should be to get some more information about it. If our correspondent would isolate the plant (by covering it entirely by a muslin tent) and rear the insect from it we should then know with what we are dealing. If he is not an entomologist, he may not like to take this trouble, but perhaps he has some friend who will not grudge it, and, failing that, if he will send an infected plant to us, dying or living, provided the roots and galls are alive, we shall undertake the enquiry with pleasure.—ANDREW MURRAY.]

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE MOUNTAIN PRIMROSES.

OUR lowland woods and pastures are not more abundantly adorned with Primrose and Cowslip in spring than the valleys, and slopes, and pastures of a thousand mountain ranges with Primroses much smaller in stature and more vivid in hue. Indeed, I once stood in an Alpine pasture of several thousand acres, in which the vivid *P. integrifolia* was everywhere as plentiful as Daisies on a lawn. Many of the kinds we are accustomed to think rare in gardens abound in like manner in Alpine lands. Sometimes they haunt the mountain bogs like our own Bird's-eye Primrose, but, for the most part, they love the friendly shelter and moisture of the Grass and Alpine turf; in numerous cases, indeed, forming a turf with numbers of their own rosettes. Like many other Alpine plants, however, these, contrary to the generally received opinion, possess great power of adaptation to varying circumstances; and the most striking aspect of Alpine Primrose vegetation I have seen was on an enormous wall of vertical cliff, far up one of the valleys of the Maritime Alps. On this earthless scarp Allioni's Primrose grew in every narrow crack in the rocks, every plant bearing numbers of deep rosy blooms, which fell in showers at the base of the cliff. In some receding parts of this cliff the plants grew where, in many cases, they never had any direct rain; and in no case was there any earth discoverable in the chinks near the eye. The plant had probably adorned the lonely cliff for thousands of years, and it could never have had any protection from the snow in consequence of the erect character of the face of the cliff. Frequently, Alpine Primroses are so small that one blossom which wells up from the heart of the rosette, stained as richly as any Rose, more than covers the whole plant from which it sprung. Sometimes a high elevation produces this dwarfness, and we may see in the warm valley plants with leaves several inches long, which, on the adjoining mountains, are not an inch across; often, however, the kinds are naturally among the smallest of beautiful flowers, as in the case of the Scotch Bird's-eye Primrose and the Alpine *P. minima*; while, in the Himalayan region, in Japan, and in the Southern Alps they assume large dimensions, so far as development of foliage and stem is concerned; with the smaller species, however, always remain the greatest size and splendour of bloom. How may this varied and extraordinary loveliness be added to the charms of our gardens? For ages we have grown abundantly the commonest of the Alpine Primroses of Europe, *P. Auricula*, which thrives in many parts of the country as well as in its native home, and, in its more delicate and cherished forms, is grown by florists with frame protection. With the exception of this species, nearly all Alpine Primroses manifest impatience of our garden culture. The long season of growth, and, on the other hand, the not unfrequently severe droughts of our summers, are against them. There is, however, little difficulty in growing species akin in character to the common *Auricula* in free moist soil, and with annual division and re-planting of the tufts. The long season of growth and warmth of our lowland gardens induces a lanky habit of growth; and many of them, emitting roots freely from the little stems, and gradually becoming weaker at the base, soon perish if not divided rather frequently. This done, they seem to become, as it were, possessed of new vigour, and go on fairly well for another season. The necessity for this division, however, does not exist in elevated, exposed, and moist districts. Mr. McNab grows a considerable variety of the handsomer species, in frames, in the Edinburgh Botanic Garden, and they are generally easy of culture in pots placed in cold frames. On the properly constructed rock garden they grow freely, thriving most satisfactorily in rather poor sandy loam, though some kinds like moist peaty soil best. It is well to secure and grow abundantly well-coloured varieties of the Common *Auricula*, as few hardy plants are more beautiful than the varieties of this species, known in the trade as Alpines. They are precious rock-garden and border flowers.

The Himalayan kinds, in the way of *P. integrifolia*, thrive best in sheltered nooks in the rock-garden and Fernery, and when planted in such positions in deep vegetable soil, grow with great vigour. The little Scotch Primrose, certainly as beautiful as any other kind, grows freely and "sows itself" on the surface of a pan or pot of moist soil, even in London gardens, and the Bird's-eye Primrose is easy of growth in parts of the rock garden not liable to get very dry. V.

CULTURE OF THE PINE-APPLE FOR MARKET.

AFTER the long, dark winter that we have had, the Pine, like the Vine, is most affected in the leaves, which are narrower and longer at this time of year, but the fruit having been subjected to cool treatment during January and February, swelled rapidly in March, and the warm sunshine is finishing them off, with that bright clear colour so much sought after, which shows how essential light and air are, in order to perfect such fruit. Pines are grown here chiefly for market, and our fruit-cutting season commences about the middle of October, and finishes about the end of May. The first batch of suckers is taken off the old plants, potted into well-drained 7-inch pots about the end of May, and then plunged in a pit, which has been previously prepared by sifting the dust out of the old tan, and mixing new with it to make up the deficiency, working them well together, and allowing them to stand for a few days, to see that the mixture does not get too hot. The highest temperature that can be called safe is 85°. By mixing the new and old tan well together, the heat in the bed is more lasting, and for the first month we keep a closer atmosphere, with as little fire-heat as possible. If the weather should happen to be hot, we give ventilation early and gradually, keeping the atmosphere cool, and shutting up betimes in the afternoon, after a light damping with the syringe. In about six or seven weeks the suckers are well rooted, and are then re-potted into the 10-inch pots, in which they are to fruit; these are again plunged in the pit, and are kept closer for a few days, according to the state of the weather. Avoid giving any check to the roots. Sometimes suckers are allowed to remain in the same pots for months before they are shifted; but this is a great mistake. The growth of a Pine plant should never be stopped, from the time the cutting is struck till the fruit is cut. I prefer leaving the suckers on the old plant till within ten or eleven months of the time when I want them to show fruit. The largest and best plants are all put together at one end of the house for the earliest, and are kept growing through the winter—with as much air every day as the weather will permit—up to March, when more air and a drier atmosphere are maintained at the warm end of the house, and only sufficient water given at the root to keep the soil in a healthy state. This treatment, continued for a month, ripens the growth and gives vigour to the plant. As April comes in, when there is more light and sun, a close moist atmosphere is again maintained, and in about a month the fruit will begin to show. By closing early in the afternoon, at 90° sun-heat, and ventilating early, using as little fire as possible, but, at the same time, keeping the night temperature up to 65° and the day to 70°, the fruit will be ripe in October, November, and December. For the spring fruit, we keep the plants growing till June, when we give them a month in which to mature their growth; this causes them to show fruit during August and September, and then get through their blooming before the dark cold days come on. The soil I prefer is the top sod of an old pasture, not more than 2 inches in thickness, which should be of a light loamy character, and ought to be packed up in a narrow stack about two months before it is required for use. Pot the plants firmly, without using any kind of manure, and thus plenty of fibrous roots will be produced. With plenty of air and light sturdy growth will be ensured, and the fruit will be well thrown up above the foliage. Never shade a Pine at any time. Shading may always be dispensed with if sufficient air be given early. The water used should always be of the same heat as that of the plunging material, which should never be allowed to fall below 70°, and sufficient should be given each time to thoroughly wet the soil. Clear water should be used till they show fruit; then weak liquid manure made from either sheep or cow dung, and used when freshly

made, as much of the ingredients mentioned being put in at every watering as will give it the colour of pale ale. Guard against over watering, especially in winter. JAMES SMITH.

Waterdale, St. Helen's.

New Potatoes at Christmas.—Mr. Calvert (p. 335) virtually asks how the Potato disease may be guarded against. I, for one, do not know, unless glass be used, and then the matter becomes simple enough. The last time I wrote on the subject I think I mentioned that the disease had so often taken me by surprise, that I had determined for the future to use glass, and I will relate how I obtained mine, and how I used it. Looking round me, I found sixteen old window-sashes, each about 4 feet square. Having constructed my pit with planking, I fitted in the rafters, and the sashes were laid ready to hand. After filling up the pit with leaf-soil, together with a little loam, my Potatoes were planted on the 16th July, the seed having been kept for over a year. As there is an acknowledged difficulty in getting new Potatoes to vegetate so early, I took the precaution of duly airing the pit until the tops of the plants touched the glass, when the sashes were tilted back and front. Not one drop of water was given at any stage of growth. The result was that for two months—December and January—I had a full supply of excellent new Potatoes for table use. When the crop was over I put a few fresh leaves into the pit, and fresh soil to the thickness of about a foot, and then replanted half the pit, on January 10th, with Ashtops. On the 21st inst., I was again rewarded with a crop of fine new Potatoes; I have, therefore, from the same pit, been able to obtain two crops a year of the young tubers of this most useful of all vegetables. My practice when planting in spring is precisely the same, except that I make use of matting to exclude frosts; whilst, for the winter crop, I fill the frame inside with Fern, which keeps the plants warm and dry. No moisture whatever that I know of is given these frame Potatoes. The varieties I use are Ashtops and Early Handsworth—the former I like best both for quality and appearance.—R. GILBERT, *Burghley*.

Osborn's Forcing French Bean.—I quite agree with Mr. Nisbet's opinion of this variety (p. 245). I sowed it on Feb. 10th, and gathered the first dish of Beans on April 3rd. At the bottom of 12-inch pots I first placed a piece of crock and a considerable quantity of dried horse-dung and then filled the pot half full with a compost consisting of three parts of good fibrous loam and one part of rotten dung, and in this I sowed the seed. When they were well up I filled the pots with the latter compost, leaving in each pot four plants, and on these attaining a height of 9 inches they branched out from the bottom, every point being covered with flowers, which completely stopped their growth. I have neither pinched them nor staked them, which is a saving of labour. On each plant there is an average of fifteen or sixteen Beans; those which I gathered on April 3rd measured 4½ inches in length, but at the present time there are plenty 5 inches long. Of their flavour the highest opinion is expressed.—R. H.

The Best Time for Planting Potatoes.—There is some difference of opinion on this subject. The opinion of such an observant authority as the late Mr. Thomas Andrew Knight is generally considered of some value on such matters, but I doubt if he will be generally believed in the matter of Potato planting when he says:—I have uniformly found that to obtain crops of Potatoes of great weight and excellence, the period of planting should never be later than the beginning of March. This opinion, too, is endorsed by the late Mr. Robert Thompson, of Chiswick, who says that if planting can be done by the end of February so much the better. Now, with all respect to these authorities, it is safe to state that their opinion is not borne out by facts. For the general crop planting, April is the month; most crops are put in some time between the beginning and end of this month. In some parts of Yorkshire field planting is often not finished till the first week in May, and the crops are always excellent and much better than they would be if planted in March. As an experiment, I once planted a quantity of early and second early kinds at the end of February; the result was the poorest crop I have ever had, for many of the sets perished by rotting in the ground, and this is my general experience. Since then I have never planted the main crop of second early and late sorts till April, conducting operations only when the soil is in good condition, and I am always well satisfied if I get such as Regents and Paterson's Victorias into the ground by the end of the month. From years of experience I find that late planting ensures by far the best crop, and that is of some importance; the plants generally escape the late frosts. The Potato will hardly vegetate until the soil is warm enough to excite Scarlet Runner Beans. I therefore cannot see any advantage in spring planting being commenced sooner than April.—J. S. W.

NOTES OF THE WEEK.

— ONE of the most beautiful features yet introduced to our park gardens has been visible for the past week or two near the Serpentine Bridge. It is a crowd of Daffodils beside the water, and surrounding the Rhododendron beds. They remind one at once of Wordsworth's poem, which we print in another column (see p. 344). There are also some naturalised in the Grass on the site of the late Mr. Mann's old garden at the Kensington corner of the gardens. We hope that these plants may be allowed to increase and multiply in the positions which they now adorn so well, for few plants are better suited for the decoration of outlying portions of the unmown lawn than golden Daffodils.

— MR. GUMBLETON informs us that *Embothrium coccineum* is now showing bloom in his shrubbery at Belgrove, Queenstown. The flowers resemble those of the scarlet Honeysuckle.

— GRAPE HYACINTHS are now in great beauty in the different nurseries about London. The differences in their beautiful and delicate shadings are well seen when the various kinds are grown in strong tufts and in beds.

— A PRIVATE meeting of the Exhibition Commissioners and the Council of the Royal Horticultural Society is said to have been held at Lord Granville's last week. The various points at issue were discussed, and it is believed that the decision come to was that the Society's lease of the gardens at South Kensington was to be given up and a fresh one granted at a reduced rental. The Society's financial claims against the Commissioners and the question of a skating rink at South Kensington, were also discussed, but no decision on these points was come to.

— THE "Pall Mall Gazette" says "the Royal Horticultural Society is deeply in debt, cannot pay its rent, and in the opinion of experts is not over-diligent in promoting the interests of horticulture. In fact, the garden at Kensington is simply a pleasant resort for children and nursemaids on ordinary days, and for young ladies and their attendant young gentlemen on Saturdays and Sundays. It was lately proposed to add a skating rink to the other attractions of the gardens, but here the patience of the lessors gave way, and it was settled that if the inhabitants of Prince's Gate and Queen's Gate wish to amuse themselves in this way, they must do so on ground of their own, not on ground which in fact, though not in name, belongs to the nation. It must in the end become a question whether an estate, which is probably undervalued at £300,000, cannot be made to minister to the public enjoyment more effectually than by being leased at a nominal rent, which is not paid, to a society of which the principal object is to maintain an agreeable lounge for a particular district of London."

— ANOTHER view of the Royal Horticultural Society.—Mr. Gordon's questions to Mr. Cross in the House of Commons on the 20th inst., respecting the estate at South Kensington which was purchased by the profits of the Great Exhibition of 1851 are appropriate (says a "Birmingham subscriber to the Exhibition of 1851" in the "Times"), just now, when it is generally known that the Commissioners, represented by Earl Granville, Earl Spencer, and Dr. Lyon Playfair, are in communication with the Royal Horticultural Society on the subject of the bankrupt state of that body. The published accounts of the Society show that it has paid off only a few hundred pounds of the £50,000 which it borrowed by debentures in 1858; that it has only paid two rentals to the Commissioners for the gardens which rentals the profits of the International Exhibition, and not the profits of the gardens, enabled the Society to pay; that the Society is under long and heavy obligations to life subscribers; and that the Society owes heavy debts for the annual working expenses, including payments for prizes at shows. I do not enter into the details of the quarrels of the Society itself since the Duke of Buccleuch's Council was displaced by Lord Bury's, because my object is to call attention only to the public interests in the estate held by the Horticultural Society. Here is a property virtually belonging to the public, and held as a public trust, from which the public derive no benefit. The 20 acres of land held by the Horticultural Society under a lease, which will terminate about 1893, represent a value of several hundreds of thousands of pounds—some say even £500,000. The Society cannot pay even £500 a year for it, and the public at large are excluded from the enjoyment of it, while it cannot be said to fulfil the purposes for which it was purchased. As one of the public, I do hope the Commissioners will duly consider these facts when they discuss the relations between themselves and the Horticultural Society.

— WE hear from Messrs. Veitch & Sons that Mr. Marks, late of Firsleigh House, Isleworth, has been appointed gardener and bailiff to his Royal Highness Prince Christian, Cumberland Lodge, Windsor Park.

THE INDOOR GARDEN.

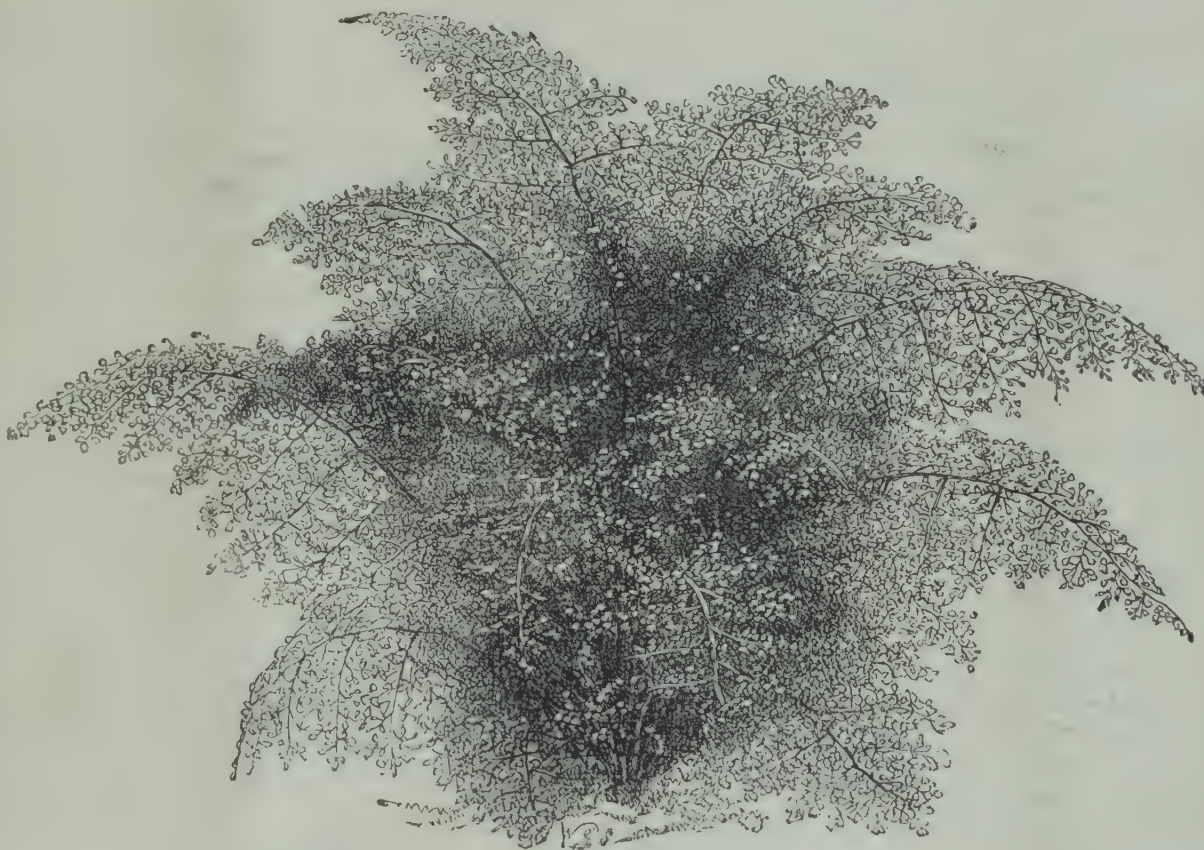
BEST SINGLE AND DOUBLE FUCHSIAS.

IN order to have well grown Fuchsias for conservatory decoration, cuttings should be made of the earliest shoots put forth by old plants of the previous year after they have been put into gentle heat in early spring, and where it is necessary to get plants from nurseries they should be obtained at once in large 60 or 48-sized pots—good plants, 8 or 9 inches at least in height. If cuttings are relied on, they should be placed in shallow pans in a bottom heat, in plenty of silver sand, or pricked out on a hotbed, where they will usually strike root in the course of a week; and, as soon as rooted, they should be put singly in thumb pots, using one-half well decomposed leaf mould, and the other half good rich yellow loam, with enough of silver sand to keep it sharp and slightly gritty. As soon as the roots reach the sides of the pots another shift should be given, for the great aim of the cultivator at this stage should be to keep the plants growing vigorously and quickly. When the second shift is given the plants may be removed to the greenhouse, keeping the house rather close for a week or ten days, when more air may be given. When the plants have attained the height of 6 inches pinch out the top of the main shoot, in order to make them branch out; and, in the course of another fortnight, the points of all the other shoots should be pinched out, except the leading one, which must be encouraged to grow to a height of 6 or 8 inches, and then again stopped. The great object of this stopping is to keep the plants bushy at the bottom, and, by judicious pinching back, they may also be kept bushy and pyramidal in shape, the best form in which the Fuchsia can be grown either for show or for decorative purposes. Supposing the season to be about the middle of the present month, the plants should be syringed morning and evening, and they should be re-potted as they advance in growth; and again the points of such shoots as may be growing too strongly should be pinched out; for, if neglected, they impair the symmetrical shape of the plants. As the sun gains strength the plants should be shaded about mid-day; and, in bright weather, they may also be frequently syringed, which will greatly accelerate their growth and keep them free from green-fly. Too much stress cannot be laid on the importance of judicious and timely pinching if the plants are to be grown into good specimens for exhibition. It would be well if the cultivator aimed at this, even if his plants were required only for conservatory decoration; for, if this were done, we should much more frequently meet with good specimens of Fuchsias in greenhouses than we now do. At first every flower should be pinched off in order to throw all the strength of the plants into the growth; and the constant pinching just referred to is for the purpose of giving the plants that even and unbroken appearance so requisite in symmetrical specimens. Presuming that by this time the plants have reached a height of from 2 to 3 feet, and are required for exhibition in July, cease taking off the flowers, allow the shoots to grow, and discontinue re-potting at least six weeks before the day of exhibition, by which time they will be full of bloom and fit for showing. Plants treated in this way may be had in bloom by the end of May. Supposing there is another exhibition in July or early in August at which the cultivator may be desirous of exhibiting, the course he should adopt on bringing his plants home from the first show is to pick the flowers off, and let the plants stand in the greenhouse a day or two to recover from any

check received during the transit to and from the exhibition; then they should be re-potted, and allowed to grow all over the surface, and brought into bloom, sooner or later, according to the time when the second show is to be held. From the end of June and onwards the house in which they are placed must have air day and night, and the plants should be syringed four or five times a day in hot bright weather. This not only keeps the atmosphere about them cool, but also moist, and it is discouraging to insects. Great advantage will now be found in covering the surface of the pots some 2 inches in thickness with well-decomposed cow manure, and every precaution must be taken to prevent the access of bees to the flowers, when air is given, by protecting them with tiffany, or some such light material. Under some such system of culture as this Fuchsias may be had in fine and continuous bloom from May to November. The plants should then have a season of rest previous to being started into growth for another year, when such plants, by skilful treatment, may be grown to almost any size. The following is a short list of good varieties:—Fuchsias having red tubes and sepals, and purple or plum-coloured corollas; Enoch Arden, War Eagle, Try me O, J. F. McElroy, Lizzie Hexham, and Gazella. Fuchsias with white tubes and sepals, and scarlet and pink corollas: Mr. J. Lye, Minnie Banks, Lustie, Lucy Mills, Arabella (improved), and Lady Sale. The same, but with rose or lavender-coloured corollas: Father Ignatius, John Bright, and First of the Day. Other good varieties are Killiecrankie, Prince

Alfred, and Lady Heytesbury. The foregoing are all single. The following are the best double varieties, both light and dark: Mrs. H. Cannell, Mrs. Ballantine, Avallanche, Alpha, Purple Prince, Marchioness of Anglesea, Marksman, Grand Duke, and Blue Beauty. It may be added that, for window culture where there are no proper appliances for propagation, the cuttings may be struck in pots only half filled with soil, which should be of a light sandy character. This will allow the cuttings, when inserted, to be covered over head with a flat piece of glass, and, thus snugly situated below the rim of the pot, they soon take root, when they

should be potted off separately and grown on in as hardy a manner as possible, so as to enable them to withstand the exposure to which they must necessarily be subjected. Quo.



Williams's Maiden-hair Fern (*Adiantum gracillimum*).

WILLIAMS'S MAIDEN-HAIR FERN.

(*ADIANTUM GRACILLIMUM*.)

OF all the Maiden-hair Ferns now in cultivation, none are more valuable and useful than the wedge-leaved Maiden-hair (*A. cuneatum*), which has hitherto been, perhaps, the most popular of all cultivated Ferns; its fronds are used by Covent Garden florists by the thousand every week in the year. Its chief claim, as a decorative plant, is mainly owing to its free habit of growth and the lace-like tracery of its fronds. The plant, which we now illustrate, is also a free grower, and, at the same time, is unsurpassed in delicate grace and beauty; indeed, its fresh green fronds resemble the lightest filigree work or the finest lace, and, in this respect, it is superior to *A. cuneatum*. *A. gracillimum* will always be especially valuable for furnishing fronds for bouquets, as their texture is so fine that they do not intercept the view of such flowers as may be placed below them, and, at the same time, impart a fairy-like lightness to the arrangements in which they are used. Some idea of the exquisite lightness of this plant may be obtained by a glance at our

illustration. It grows well in any ordinary plant-stove or warm greenhouse, the best compost being one composed of fresh fibrous peat, to which about one-fourth of fresh turfy loam and a little leaf mould has been added. The pot should be well-drained, and a liberal supply of water at the root and humidity in the atmosphere is beneficial when the plant is making its growth. B.

Salvia splendens.—This, as its name implies, is one of the most brilliant and showy of Salvias, and a plant which I can strongly recommend where showy flowers are prized for winter decoration. Although generally considered a greenhouse plant, being a native of Mexico, it requires rather more than ordinary greenhouse temperature to grow it in perfection, as the blooms do not expand freely in a low degree of heat, and are apt to damp and fog off. Like most of the Salvias, it is of easy culture; and if cuttings are put in at once, and carefully potted on when struck, they will make useful plants for blooming in October. To have the heads of bloom of large size, the plants must be grown freely on through the season without a check of any kind, and they thus get good strong shoots and ample foliage. To carry this out, the cutting should be potted off into 60-sized pots, in light, rich vegetable soil, consisting principally of thoroughly decomposed leaf mould and turfy loam. They should then be placed in gentle moist heat for a week or so, to give them a start. When well-rooted, nip out the top of the shoot to induce them to break and form close bushy plants. As soon as the side shoots show themselves they should be potted on in the same kind of soil, and afterwards placed in a close pit, or frame, till they start freely into growth. Gradually increase the air on all favourable occasions, so as to inure them to full exposure by the end of May, when they may be plunged out in an open situation to complete their summer growth. The plunging material may consist of half-rotten leaves, old tan, or coal ashes; but the former is preferable, being more open, a good non-conductor, and very retentive of moisture. The principal object in plunging plants is to prevent the action of the sun and air from drying and overheating the pots; and any light loose material, such as half-decomposed leaves, answers the purpose admirably. Plants placed out without plunging are subject to extreme and rapid changes of alternate heat and cold, with their attendant results—starved and stunted growth, red-spider, &c. All plants placed out of doors should, therefore, have their pots plunged, or shaded in some way. As soon as the pots containing the Salvias are filled with roots, they should be shifted freely on, if large plants are required. On dry sunny days the plants will be greatly benefited by having the syringe used upon them in the course of the afternoon or evening. It will be necessary to house the plants by the middle of September, giving them a light airy situation. They should then be kept in a temperature of 45° to 50°, where they will display their brilliant heads of bloom in full beauty, for at least two months. After flowering, most of the old plants may be discarded, as much room is thereby saved, and young plants are more vigorous than those a year old. *Salvia Heeri* is a valuable variety to succeed the above, and is one of the most effective plants we have for blooming during February, March, and April; and too much cannot be said in praise of this splendid variety. Although it has not the brilliancy of *splendens*, it rivals it in inflorescence; and, as it does not flower at the same time, it is equally desirable, and should be in every garden where gay flowers are wanted. *Salvia gesneriflora* is a fine spring blooming variety, but not at all equal to *Heeri* for freedom of bloom and general effect. It may be mentioned that neither of these bear forcing, and are soon spoiled if subjected to artificial heat. They must, therefore, be allowed to come on naturally in an ordinary greenhouse temperature.—J. SHEPPARD, *Woolverstone*.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Paxton's Hoya Fruiting.—Can any of your readers inform me if *Hoya Paxtonii* has hitherto borne fruit in this country? I have succeeded in fruiting a plant this season, and the occurrence is at all events a rare one.—CHARLES TURNER, *Eastwood Hall, Notts*.

Maxillaria Turnerii.—I met with a small plant of this pretty Orchid the other day in the Wellington Nursery, and was delighted with its delicious perfume, which exactly resembles that of the common Honeysuckle. Another Orchid—the green-sepalled white-tipped *Pilumna fragrans*—has the odour of the Poet's Narcissus, and *Dendrobium (aureum) heterocarpum* has a perfume like that of Violets.—B.

New Camellias.—In your remarks upon Camellias I never saw any description of the two following superb varieties:—*Bianca Geraldine*, which is large, a creamy-white, and perfect in form; it has thick petals, and small yellow stamens appearing in the centre. The foliage and growth are very fine; it never loses a bud, but is not a free bloomer. Its blooms hang nearly three weeks. *Archiduc Etienne* has large blooms of light shaded pink, of finely reflexed form, with small curled petals in the centre; never loses a bud, blooms freely, and the flowers hang for a long time. The plant is of fair, but not of the best habit; but cannot be termed straggling. These are both very valuable kinds, and deserve to be better known. My Camellias are planted out, and I do not know how the above would behave in pots.—AMATEUR, *Birmingham*.

THE FRUIT GARDEN.

GRAPES WITHOUT ARTIFICIAL HEAT.

To those who have but a limited heated space at their command it is of some importance to be able to produce good Grapes, fit for dessert, with the protection of a glass roof alone. I will therefore describe, as briefly as possible, an amateur's Vinery, that annually finishes off excellent crops of Grapes, without the aid of any fire-heat, and with only ordinary care and attention. The owner is a retired builder, and consequently had a better knowledge of erecting the building than of the formation of borders and the after management of the Vines, a knowledge he had to acquire by hints from local gardeners, or the calendars of the horticultural press. The dimensions of the house, which might be enlarged or reduced without greatly altering the result, is 20 feet long, by 12 feet wide; the back wall is 12 feet high, the front wall 1 foot 6 inches. There are no front lights; but, under each rafter is a small ventilator. The lights are five in number, and measure 4 feet each. This, as anyone will observe, is a simple structure, but it is well adapted to the end in view, which is to obtain a sharp-pitched roof that can catch a maximum of sun-heat, and give the slightest amount of drip, thus securing a dry and buoyant atmosphere, in which the fruit may be kept in good condition, until the danger of severe frost renders it necessary to cut the remnant of the crop. There being no heating apparatus to exclude the frost, the house is useless for storing plants, so that the Vines are more thoroughly rested, as a very cool atmosphere is maintained, and the Vines do not get excited into growth sooner than those on open walls—a very important point, as the later they are kept from starting the less prospect there is of their receiving any severe check from the sudden variation of temperature which they would receive if started earlier. When they can be no longer retarded, which is usually about the beginning of April, the house is shut up close, and damped down as soon as the sun begins to decline, which process is followed until the Grapes begin to colour, when the damping is discontinued, and air is left on at night. It is also most important that ventilating should commence as soon as the temperature begins to rise, and be gradually increased until mid-day. The restrictive system of training is adopted, one rod being trained under the centre of each light, and every shoot stopped at one joint beyond the bunch. The foliage is not crowded, but every leaf gets the full benefit of sun and air. The result is from 30 to 40 lbs. of Grapes, that no professional gardener need be ashamed of, to each rod. The varieties are Black Hamburgh, Sweetwater, and Muscadine. The border, like the house, is simply but efficiently formed. The soil being naturally good was trenched; and several loads of turf, and a considerable quantity of bones added. No cropping is carried on over the Vine roots, which are also at liberty to extend into the vegetable quarters in search of food. The border is annually deluged with sewage manure, and although the Vines are so heavily cropped, the wood is strong and well matured. It is the system of converting Vineries into plant houses that brings the majority of insects to prey on the Vines. Do away with the cause, and you will have no reason to complain of these pests. I would, in conclusion, strongly advise amateurs to content themselves with old well-trying sorts that are proved to succeed with a moderate temperature, for, if they are ambitious of rivalling some of our great Grape growers in the growth of Muscats without heat, they may expect to record a failure.

Henham.

JAMES GROOM.

"DAMPING" FRUIT-HOUSES.

DAMPING is a term used to denote an important and every-day operation in the culture of hothouse plants, whether grown for fruit or flowers, and in most garden establishments becomes a considerable item of daily labour. It is a phrase with which every garden operative is familiar, and he looks upon the damping and syringing as an indispensable part of hot-house fruit culture, of which he would no more think of questioning the utility than he would that of regular ventilation. Nor is he far wrong in his faith in the syringe; but its universal employment for this purpose often leads to a practice

of indiscriminate damping, regardless of weather and other conditions, which is fraught with the worst results. Like firing, damping is a matter that requires judgment and discretion, for it is necessary to distinguish between the wants and habits of different subjects and their condition at the time and under the various circumstances of hothouse culture; otherwise the remedy may prove worse than the disease. The practice, we may be sure, has always been a concomitant of flues and hot-water pipes in hothouses, and was probably first suggested by the fact that, under natural conditions, damping takes place in the form of dew, which saturates every leaf and blade, and restores their flagging vigour after exposure to a bright sun and a dry atmosphere during the day. At other times the same end is accomplished by an overcast sky, which arrests radiation and evaporation, and thus permits the foliage to gorge itself with moisture from the roots, which can then pump up the supply faster than it is dissipated. In a hothouse, however—a Vinery, for instance—these conditions, so favourable to plant life, are entirely reversed; for there can be no dew under a glass structure heated with hot-water pipes, but rather an unnatural state of aridity, which would in the end be destructive to plants were it not counteracted, as far as is practicable, by syringing the foliage and sprinkling the borders and other dry surfaces, in order that the proper degree of moisture may be maintained as steadily as possible. But, however indispensable damping may be under such circumstances, it is obvious that it may easily be overdone in a close structure where the atmosphere is under our control. Dew is generally deposited after bright sunshine, when it is most needed, and, as a rule, does not rest more than a few hours upon vegetation. In other words the foliage is dry and in an active state of perspiration during the greater part of the twenty-four hours—a fact which should be constantly borne in mind, but is often overlooked; and most practitioners err, as they think on the safe side, by giving too much moisture. As a learner I was taught the still common practice of shutting up and damping and syringing copiously early in the afternoon—abating the supply somewhat on dull or wet days, but hardly ever discontinuing it wholly—damping again in the evening, steaming the pipes, &c., and syringing and damping again in the morning; and thus, with Peaches, Vines, &c., in early forcing, keeping the atmosphere of the houses partially saturated for nearly sixteen hours out of the twenty-four.

Injurious Effects of Damping.

Such treatment I have in most cases found to be productive of green leaves and an apparent luxuriance for a time, but the real consequences are weak wood and foliage, and generally impaired health, which ends in failure (partial or complete) in the course of time. This is no exaggerated picture, for such practises are inculcated daily among many of the rising generation, who carry with them wherever they go an unquestioning faith in copious and frequent dampings, until experience teaches them otherwise. I very seldom get a strange hand who does not, as a rule, look upon the syringe and watering pot as his inevitable daily companion, morn, noon, and night. Now, Nature is a tolerably safe guide in this matter. Dew, or the moisture we see in a condensed form upon out-door vegetation on a clear night, is sufficient to reanimate every leaf in a short time—in fact, it only promotes repose after the day's fatigue under the influence of light and heat—and no more is required. It is the same in a Vinery or Peach-house, &c. Give sufficient moisture to restore the flagging foliage and prevent evaporation from its surface during the night, and it is enough. Practically speaking, damping once a day, or at most only slightly in the afternoon and again in the evening, is quite sufficient for most kinds of fruit or plant houses, and that only on fine dry days. In dull and wet days it is not necessary at all, unless under hard firing. It is also a bad practice to reduce the ventilation too much at a time, as is often done in shutting up in the afternoon, and damp copiously at the same time. A sudden transition from drought to saturation is a decidedly unnatural and unhealthy state of things. I dare say many of your readers have noticed, with Vines that have been drooping under a bright sun, that the mere partial closing of the ventilator, which shuts in the moisture arising from the border, is sufficient to restore them in a short time. It is not a good sign, however, when fruit trees under glass flag on a sunny day; it is a sure indication of thin, weak foliage, produced by high temperature in a close moist atmosphere. It is doubtless necessary in forcing to economise the sun's heat, and this can only be done by shutting up early in the afternoon; but to effect this it is not necessary to close the ventilators entirely. The most rational practice is to begin by giving air gradually, as early in the morning as possible, and to reduce it at the same rate till the minimum amount is reached at dark; for the ventilators should never be closed altogether. In bright days sprinkling water frequently about the floors and passages is a good practice, as it keeps down the temperature, and lessens the

necessity of giving too much air in cold and dry though sunny days; but shutting up and syringing at the earliest possible moment after mid-day is neither necessary nor advisable. At dusk a copious damping may be given fearlessly, for by that time the foliage is prepared for it by reduced light and ventilation, in the same way that a gradually overcast sky prepares Nature for the "expectant rain." Here we neither wash nor dress either Vines or Peach trees as a preventive against insects, and we only damp once a day, in the evening; yet our trees will compare favourably for cleanliness with any that have been so attended to. The hygrometer is an instrument too seldom employed in our hothouses; indeed, plenty of gardeners do not understand its use. Occasional reference to it would show the state of the atmosphere, as regards moisture, under different circumstances. It would show that in a Vinery during a clear frosty night, when a high temperature is maintained, the amount of dryness is sometimes as much as 6°, 7°, or 8°—nearly as much as is sometimes indicated at noon during a dry day in April or May—and this when the air should be at the saturation point, or nearly so; for it must be understood that these figures indicate the actual amount of drought the foliage is being subjected to when it would, under natural conditions, be laden with moisture, with no evaporation. On the other hand, in a Vinery in which the temperature is allowed to subside considerably below the usual figure at night and little fire heat is used, I find the dry and wet bulbs are nearly equal, and, as might be expected, the edges of the Vine leaves are laden with dew drops. That conditions so dissimilar must produce widely different effects for good or evil on the plants is evident; and it is not to be wondered that there is so much disease and debility amongst the inmates of forcing houses. The greatest difference I ever noted between the dry and wet bulbs in a Vinery at noon was about 18°, during a droughty day, with open ventilators. The greatest difference I remember out of doors was in May, when I occasionally noted as much as 14°. It requires sturdy healthy foliage in a Vinery to bear up under such circumstances; it is this which tries the foliage of Vines so much about midsummer, and produces those blistered leaves which are so often complained of by Grape growers; and Vines or other fruit trees which have been pushed on under high night temperatures, and in a too moist atmosphere, are the least able to bear the strain.

Damping Melons.

Melons I have always found to be particularly sensitive in this respect, the leaves of early plants frequently crumbling up in April and May, or falling a prey to insects, just when they should be attaining their maximum vigour. This is owing to the high temperatures and continually saturated atmospheres to which the plants have been subjected in February and March, when the least amount of air can be given, and which produce thin flabby leaves, unable to resist bright sunshine and a free circulation of air later in the season. To prevent this state of things, damping upon short days and during dull weather should be reduced to a minimum, and an abatement made in the night temperatures. I lately found in our Melon-house, where no damping had taken place for twenty-four hours, that the difference between the dry and wet bulbs at night, with moderately hot pipes, was only 3°—a safe disparity, which proved that no damping was needed. The day following, during a spell of bright sunshine, the difference between the dry and wet bulbs rose to 14°, and this after we had dull weather; but no drooping was noticeable in the leaves, nor on our pot Vines in full leaf, neither having been pushed at night previously, nor kept too moist at any time. From experience of this kind I have come to the conclusion that, with hothouse plants, and especially fruit trees under ordinary circumstances, damping or syringing overhead is not needful except during the hours of darkness, and should not be practised at any other time, and that the temperature at the same time should be as low as is consistent with safety, to arrest evaporation, otherwise the moisture can remain only a short time upon the leaves. I know it is hardly possible to adopt the practice of syringing after dark, but with lower night temperatures a single dewing in the evening would be sufficient. It is a problem worth solving whether it is better to sustain by fire-heat a night temperature equal to that which a plant would enjoy in its native habitat during our long dark nights, or abate the temperature at these hours in proportion to the altered circumstances and situation. For example, is it better to subject a tropical plant to a temperature of 75° by night, when it has to be sustained at that figure by fire-heat alone, or allow it to fall, perhaps to 55° or 50°, and thereby secure that rest to the plant which it would undoubtedly enjoy in its native land, though subjected to a higher temperature? My conviction is that the latter practice would be attended with the best results. Of stove plants I shall not speak at present, but in the case of Vines and Pines such treatment is borne without injury, if not with positive advantage, leaving fuel

(an item of some importance) out of the question. I have on several occasions this season subjected Muscat Vines to a night temperature of 48° when just about coming into flower, without the least bad effects; and during the late cold weather Hamburg Vines with the berries set have been frequently as low as 50°, and both fruit and leaves are in perfect health and vigour. J. S. W.

FRUIT CULTURE IN QUEENSLAND.

REGARDING fruits, the "Queenslander" observes that the Fig will flourish in a great variety of soils and situations in Queensland, and is easily propagated from cuttings. Many European varieties have been imported here, and are under trial, such as Brown Turkey, Grizzly Bourjassote, a light-coloured, valuable fruit; Poulette, another dingy, pale-coloured fruit, excellent, and prolific; white Marseilles, greenish-white, a good bearer, and of luscious sweetness; Grosse Verte, large, pale-green, rich, and excellent, late, in wet seasons apt to crack, and not so prolific as some; Smyrna, very similar to the foregoing; large black Genoa, flesh red, abundant bearer, excellent in flavour; brown Ischia, medium, chestnut-brown colour, good in flavour, and prolific; white Ischia, rather small, good bearer, and very rich. If the trees, when of sufficient age to bear, are barren, but vigorous in foliage, they are given a moderate root-pruning in winter, which gives a slight check and produces fruitfulness. Then comes the Guava, a well-known and prolific fruit-bearing tree, which is readily propagated from seed or layers. The yellow is the largest variety, quickest grower, and very aromatic. The green is smaller, but better in quality. The purple (Cattley's) has small roundish fruit, of exquisite flavour when perfectly ripe. The fruit of all the species makes good jelly. Next comes the Custard Apple, which is a delicious fruit, and the tree thrives well, but has not been very extensively proved yet. The following are valuable, viz., Sweet Sop (*Anona squamosa*); tree, small; fruit, carbuncled outside; pulp, delicious. Rough fruited and smooth fruited—Very similar in size and habit of tree, which is large and vigorous, as also the fruit, which is larger than that of the preceding, and of excellent quality; but the smooth fruited appears to be the most prolific. The Date Plum (*Diospyros Kaki*) is found in Japan in almost countless varieties, being to the Japanese what the Apple is in England—an every-day useful fruit. It is found of all sizes, qualities, and seasons, some suitable only for the kitchen, and others indispensable for the dessert. Besides the Kaki and Mabolo, five varieties have been received recently from the Horticultural Society of Victoria, imported from Japan. As seedlings of the Kaki have been pretty largely distributed, these ought to produce quite a variety of qualities, as the fruit sports greatly from seed. The tree is easily propagated by grafting, or by root cuttings. The Litchi, or Leechee, is a valuable Chinese fruit, which thrives well here. The tree is a bushy evergreen, which bears abundance of exceedingly good fruit in clusters, or loose tapering bunches; it is propagated by means of its stones, which germinate as readily as Loquats; also by layers, or grafting on seedling Litchis or on Longans. The Chinese claim that they have several kinds of this fruit, but say that it is rather particular, if not capricious, in its choice of soil. The Acclimatisation Society have several varieties under observation. The Longan belongs to the same family as the foregoing, but its fruit is smaller and not so good, but the tree appears to thrive in a greater variety of soils and climates. The Loquat, though better known, does not commonly receive the attention which it deserves. It is generally raised from seed, and the trees thus obtained often produce fruit of very different qualities. There is ample scope in the case of this one fruit for the efforts of some persevering, intelligent cultivator to raise new varieties, and propagate desirable ones by grafting.

THE EFFECTS OF VINE-BLEEDING OVERRATED.

There are few things which a gardener dislikes more to see than his Vines bleeding freely. Yet it has always struck me that the injury done in this way is often over-estimated. When young, I had a lot of well-grown Vines which I intended to fruit in pots. These were cut down to a convenient length, and at once placed in heat. As might have been expected, had I had more experience, they began to bleed; and in spite of all I could do, they went on bleeding. I burnt the cut ends with red hot irons, and then covered them with melting wax; but this treatment had no effect. Paint would not touch the wet surface, nor anything else stop the sap from running. At last some one told me to try a Potato stuck on the cut end of the Vine; and this did in a great measure stop the flow of sap, which had continued many days; but only a short time before it would have stopped of itself, as the Vines were soon in leaf. In spite of all this loss of

sap, I never had Vines which bore a better crop of Grapes than these did. Then, again, I once had a Muscat Hamburg which was a great puzzle to me. It grew at the coldest end of a 60-foot Vinery; and though it was always pruned early—in fact, almost as soon as the leaves were off—and the house was only kept at greenhouse temperature during winter and spring, yet this particular Vine always bled badly at every place where it had been pruned. I never had any other Vine which acted in this manner, either in this or in any other house. Nevertheless, this Vine, when in fruit, was never considered inferior to the others, and it always carried a full crop. These cases have left an impression upon my mind that, however undesirable it may be to have bleeding Vines, it is not quite so dangerous a thing as is often imagined. Can anyone say if this sap has ever been analysed? We know that a Vine will store up sap in itself sufficient to put out shoots and leaves before the roots have had time to grow in spring; and that when this stored-up sap is expended, growth is suspended till the roots get into action. Now, if by bleeding, Vines lose this stored-up sap, it must be injurious to them; but when Vines continue to bleed, I think it can be little else than water passing through them. I do not know how a leadless Vine can make sap; yet we are quite sure that Vines lose, by bleeding, far more moisture than they ever contained at one time. Is it not probable that a bleeding Vine would sustain most injury soon after it began to bleed? Any loss of sap, we would think, must take place at that time; afterwards, I should expect to find the liquid little more than water, just as absorbed by the roots. What is the opinion of Grape-growers on this subject? J. W. PEARSON, in "The Gardener."

Seedling Apricots.—A neighbour of mine has a seedling Apricot covering a portion of the front of his house. The stone was planted more than twenty years ago, and for many years it has rarely failed in producing a crop, owing to its sheltered position under the projecting eaves of the building. It seems in flavour and appearance identical with the Moorpark, the parent. He has also another seedling, about four or five years old, flowering for the first time this season. I think Mr. Gilbert deserves the thanks of your readers for calling attention to this matter; in fact, the wonder is, considering how easily they are raised, and the comparatively short time before they bear, that seedling Apricots are not more plentiful; and not only Apricots, but also Peaches and Nectarines. There are, in most gardens, bare intervals of wall between established trees that might be turned to good account in this way, without costing a farthing; and, even if some of them were inferior to their parents, others might be superior. But I think, so far as I have seen, there is less variation in Apricots than in other fruits, when raised from seeds.—E. HOBDAV.

Varieties of Cranberry.—At the annual meeting of the New Jersey Cranberry Growers' Association, Dr. Brakeley said he had noticed the following nine well-characterised varieties of the common cultivated Cranberry (*Vaccinium macrocarpum*):—1. The Cherry—the common variety. 2. The same flattened at the extremities, reminding one of a cheese. 3. The Pear-shaped. 4. The same, uniformly small. 5. The Bugle, shaped like bead of this name; large and deeply coloured. 6. The same, but frequently cylindrical and uniformly light coloured. 7. The Cream-coloured, bell-shaped and uniformly small. 8. The same, in shape between the Cherry and Bugle. 9. White, frequently tinged with cherry. Mr. French mentioned the fact, as characteristic of the sale of berries, that a very bright mottled berry had found a ready market. He had shipped, with some doubt as to their popularity, several crates of these berries to the west, and there had been a demand for more packages of this description. White or cream-coloured Cranberries were also mentioned as occurring in cultivation in New Jersey.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Apple Trees Split by Cold.—A correspondent writing from Michigan, states that the long and severe cold weather has injured Apple trees badly. Some are split the entire length of the trunk through to the heart, and the crack on others opens nearly an inch at the surface.

Seedling Apricot Trees.—Referring to recent notes on this subject in THE GARDEN, permit me to say that, according to my experience, no reliance whatever can be placed on trees from seed, as they vary very much as to quality of fruit, and are generally small and comparatively worthless. Trees grown in warm and calcareous soils will seldom lose their branches. There is no such thing as preventing the decay of branches entirely, as it appears, to some extent, on the most suitable soils.—D. GUIHENEUF.

Protection of Fruit Trees from Birds.—At a time when fruit trees are blossoming, and when sparrows and bullfinches have commenced their annual raids upon them, we may, says the "Revue Horticole," make known a method of frightening away these diminutive plagues. This consists of limewashing the trees, and from the moment they are thus whitened the birds disappear, and there is no further occasion to dread their attacks.

THE FLOWER GARDEN.

THE WASHINGTON LILY.

(*L. WASHINGTONIANUM*.)

THE Lily illustrated (see p. 300) as *L. Washingtonianum* is not that species; on the contrary, it is a totally different Lily. The one figured I first imported in 1873, and introduced it under the name of *L. purpureum*. Shortly afterwards, seeing that an eminent authority, as regards bulbous plants, had catalogued it as *Lilium Washingtonianum purpureum*, and thinking that he might be right, although the bulbs of the two Lilies differed, and that possibly it was a variety, I also catalogued it under that name. Since, then, however, from seeing more of it, I have come to the conclusion that the two kinds differ materially—that, in fact, they are as distinct, one from the other, as *longiflorum* is from *Brownii*. Compared with *L. Washingtonianum*, *L. purpureum* has a different habitat, bulb, flower, and colour; but differs most of all in its growth, mode of flowering, and arrangement of the flowers on the spike.



The Washington Lily (*L. Washingtonianum*).

The accompanying is an illustration of the true *Lilium Washingtonianum*. Compare this with the figure at page 300, and you will perceive at a glance how different the two Lilies are. I also send a coloured drawing of a new Lily, *L. Bloomerianum oscellatum*, from Santa Rosa Island, that I imported last autumn for the first time, which, as may be seen, is a charming addition to this now popular family.

WILLIAM BULL.

DOUBLE DAFFODILS.

It is a singular fact that some Daffodils very readily become double; even change of soil and locality seem favourable to the production of double flowers, and in some parts of France, especially near Orleans, and also in Italy, near Naples, the different indigenous forms of *N. Pseudo-Narcissus* are more frequently found with double flowers than with single ones. Double-flowered Daffodils are not all sports of accidental origin, as is the case with Camellias and Azaleas, but may be raised from seed, a fact well known to the quaint old gardeners of the last century, one of whom, Hale, curiously enough, observes:—"The Varieties of *Narcissus* raised by Culture are much more numerous than the Species we have from Nature." The following varieties of *Narcissus* are probably never met with in a double state, or, if so, very rarely, viz.:—*Juncifolius*, *bulbocodium*, *pachybulbos*, *elegans*, *serotinus*, *Broussonetii*, *intermedius*, *Macleanii*, *biflorus*, *viridiflorus*, *calathinus*, *triandrus*, *dubius*, *gracilis*, and *canariensis*. The following frequently assume a double-flowered condition, viz., *N. Pseudo-Narcissus*, *incomparabilis*, *odorus*, *Jonquilla*, *Tazetta*, and *poeticus*.

N. Pseudo-Narcissus.—Of this variable plant we have four or five showy double forms, one of the most rare and interesting of which is the true double-flowered form of our common English Daffodil. This variety was well known to Parkinson, who figured and described it (1629) as *Pseudo-Narcissus anglicus fl. pl.*, or Gerrard's Double Daffodil. It has often been confounded with the common large deep yellow-flowered double Daffodil of our gardens and orchards, but it is quite distinct from all other double forms. The perianth segments are of a pale sulphur-yellow, and the duplicate

segments of the fringed crown are clear yellow, as in the wild form, but not nearly so deep as in the common double kind. The common double Daffodil of gardens is a form of Haworth's *N. telemonius* (which is very nearly related to *N. major* of Curtis), a form of *N. Pseudo-Narcissus*, having large deep golden-yellow flowers, with pale yellow perianth segments. It is a native of Spain, and the single form is much more rare in gardens than the double one; indeed, this plant and its ally, *N. major* (which is abundantly naturalised near Tenby, in South Wales), seem inclined to produce semi-double and double flowers nearly everywhere in cultivation. The common double Daffodil was known to Haworth as the Pale-pointed Double, and it is probably the same plant as that described by Parkinson as Mr. Wilmer's Great Double Daffodil. The largest of all the double-flowered Daffodils is *grandiplenus*, or Trade-scant's Great Double Daffodil of Parkinson, a large, thick, massive flower, with green-pointed segments among rich golden or orange-tinted coronal divisions. In warm seasons this is very showy; but, when the months of March and April are cold, windy, and wet, the flowers are plethoric masses of dingy green segments, which never open properly; this is a monstrous double form of *N. major*, or one of the other large deep yellow Spanish varieties. Another Spanish plant, *N. Pseudo-Narcissus cernuus*, having creamy-white nodding or pendulous flowers, produces two double forms of great beauty. *Cernuus plenus* is a full, open, Rose-like flower, the perianth and coronal segments being creamy-white, and the centre of the flowers have often a tinge of lemon-yellow in them. Sometimes the multiplication of parts in this and other double forms of *N. Pseudo-Narcissus* is confined to the corona, and then the result is a very handsome flower. In some seasons, however, the corona bursts open, and then the flower assumes a Rose-like aspect. *Plenus bicinctus* differs from *cernuus plenus* in having a double row of normal perianth segments, as well as a double corona. One of the most interesting of all the double-flowered varieties of the Daffodil is that figured by Parkinson as *Pseudo-Narcissus gallicus minor fl. pl.*, and by the late Dean Herbert as *Ajax Eystettensis*. In all the forms just mentioned there is a duplication of coronal as well as perianth segments, but in this the multiplication of parts is entirely confined to the perianth segments, which overlap each other in six regular rows, just as do the petals of a Lady Hume's Blush Camellia. This is one of the rarest of all the double-flowered forms, being seldom met with in our gardens, although evidently well known in the time of Parkinson, who figures and describes it very accurately in his "Paradisus" (at p. 107, fig. 4 and p. 105). An irregular form of the last variety is evidently alluded to by Hale at pp. 354-5 of his "Eden," as the



True Double Daffodil.

Double Lemon Daffodil, which he describes as "familiar in full Perfection in the Gardens of Holland, but, though not unknown to England it does not often show itself in its proper Lustre." And, he adds, "the segments are long, obtuse, waved at the Edges, and disposed in a wild and irregular manner, not as in many double flowers in a Number of Series." On plate 44, of the last-named work, Hale figures what he calls the Silver and Gold Daffodil (? *N. bicolor fl. pl.*), and, at p. 517, he says, "The petals are of a very delicate, shining, silvery-grey, and the Cup yellow. This is the natural colouring; but sometimes the yellow runs in light

Variegations among the grey, and often the grey in the same Manner spreads itself among the yellow; either way the Colouring is extremely singular as well as pretty." And, under the head of culture, at p. 518, he observes, "This rises from the Seeds of some of those large single Daffodils which we have observed before are the original Produce of the common wild English Kind," and, a few lines lower down, he adds, "The great Art to obtain these double and variegated Flowers is to sow often and largely."

N. incomparabilis (Great Peerless Daffodil).—Of this there are several forms, three of which are often well marked and distinct, viz., Orange Phoenix, a kind with white perianth divisions, among which the rich orange segments of the corona are shown off to good advantage. The common double form of old cottage gardens has yellow segments, among which are scattered the divisions of the deep orange cup. This last is popularly known as Butter and Eggs, a name doubtless suggested by the colours of the flower. The third is creamy-

white, with yellow coronal segments in the centre of the flower, and is known as the Sulphur Phoenix. All these forms are sometimes seen in a semi-double state, the cup in that case retaining its entirety, the multiplication of parts being confined within its radius. Hale gives an excellent figure of this species, which he calls the Nonpareil Daffodil, and, at p. 482, he says, "We have said it is a Creature of the Gardener's Art, and the same management which first raised, must preserve and may improve it. The Seeds which ripen freely should be sown in the manner we have directed for the other Narcissi, and the young plants treated with the same care. They will show a great deal of Variety; some Flowers will be larger, others smaller, some better coloured, others worse, and there will be some double, or, at least, semi-double. These must be separated (the largest and best coloured with the double and semi-double flowers) into a bed by themselves, the others planted to supply vacancies and give Variety in common borders. From the Seeds of the semi-double there may always be raised perfectly double flowers, and these, as well as the finest of the single, may be afterwards increased by Offsets." Parkinson, at pp. 68-9, of his "Paradisus," mentions four varieties of this plant, and two of them he describes as producing geminate or fasciated flowers, but no allusion is made to perfect double-flowered varieties. One white-flowered form he describes as follows:—"N. maximus griseus calice flavo, the Grey Peerless Daffodil—This Peerless Daffodil well deserveth a place among these kinds, for that it doth much resemble them, and, peradventure, is but a difference raised from the seed of the former, it is so like in leaf and flower, but that the leaves seem to be somewhat greater, and the six outer leaves [segments] of the flower to be of a glistening whitish-grey colour, and the cup yellow as the former, but larger." This last-named plant is *N. incomparabilis* var. *albus* of our gardens, and I have quoted Parkinson's description to show that Daffodils were commonly raised from seed two centuries and a half ago. This suggests the question, where are all the innumerable forms that cultivators of these popular flowers have raised during this lapse of years? Mr. W. Baxter informs me that *N. Sabinii*, one of the finest single forms of *N. incomparabilis*, has died out in the Oxford Botanic Garden. Does any cultivator possess this plant still, or is it lost to our gardens?

N. odoratus (Fragrant Narcissus).—Of this plant there are two well-marked double-flowered forms, not unfrequently met with in old-fashioned gardens. One has double rose-shaped flowers, two or even three on a scape, of clear golden-yellow colour, made up of coronal and perianth segments. This form, which is by no means scarce, may often be seen at Covent Garden and other flower markets in the shape of cut flowers. In another form, more rarely met with, the duplication is confined almost entirely to the perianth segments, as is the case with Herbert's *Ajax Eystettensis*. This singular form is figured by Parkinson in his "Paradisus," therefore it has been long known in gardens. The double varieties of *N. odoratus* are popularly known as Queen Anne's Jonquil, and it would be interesting to hear how and when the name originated.

N. Jonquilla (Common Jonquil).—The double form of this old plant is well figured by Parkinson, who, singularly enough, gives a very poor engraving of the single form. It bears two or three golden-yellow fragrant flowers on a slender, deep, glossy-green scape, the individual blossoms being considerably smaller than those of *N. odoratus*, and more pleasing in form. It is a common and well-known plant in gardens, and is valuable in the shape of cut flowers. This and the single form, when forced in pots, are useful both for greenhouse and drawing-room decoration during the earlier months of the year. A plant, which I suspect is a double form of *N. odoratus*, is figured on plate 38 of Hale's "Eden" as the Double Jonquille.

N. Tazetta (Italian or Roman Daffodil).—This is the most variable of all the species of *Narcissus*, there being at least fifty well-marked forms of it, only one of which—the "Double Roman"—is, so far as I am aware, found in a double state. This double variety is well known, and extensively cultivated in pots for early flowering. It is singular that we have only one double-flowered variety among all the numerous forms of this plant, and the precise kind from which this double variety sprang appears to be unknown. Mr. Barr, who, as is well known, has paid much attention to *Narcissi*, has a delicious fragrant white-flowered form with a rich orange cup, named *N. Tazetta* var. *japonica*; and this is supposed to be the single form of the Double Roman, although it looks very different, when grown in the open air, from that variety. The double kind varies from a perfectly double flower, consisting of a white perianth and deep orange coronal segments in equal proportions to a form in which the duplication is strictly confined to the corona itself, the normal number of perianth segments being present in their usual form. A deep yellow form is figured on plate 37 of Hale's "Eden" as the Double Oriental *Narcissus*, and Parkinson gives engravings of two forms at p. 85 of his oft-quoted "Paradisus," one of which bears four or five-flowered

scapes of large white flowers, having a crumpled or broken yellow cup in the centre. In the other form the duplication mainly consists of the white perianth segments.

N. poeticus (Pheasant's Eye).—Of all the double forms of *Narcissus*, this is the most strikingly beautiful, in purity and sweetness rivalling even the flowers of a *Gardenia*. The pure glistening white perianth segments are incurved, and a few crimson-edged coronal segments are interspersed among them at the base. In doubleness this plant varies in different soils; but it deserves to be extensively cultivated for the sake of its fragrant flowers, which open about the middle of May. As cut flowers they are very useful, and possess the advantage of lasting in good condition for a long time in water after being cut. Parkinson, in his "Paradisus," p. 83, describes three double-flowered forms of this species, and at pp. 84-5 he describes and figures a double-flowered form seemingly intermediate between *N. Tazetta* and *N. poeticus*. In his engraving, which represents a four-flowered scape, the Rose-like flowers are shown as large as a bronze half-penny, and this he calls "*Narcissus chalcidonicus fimbriatus multiplex polyanthos*, the Great Double Purple-ringed Daffodil of Constantinople." In his description he quaintly contrasts it with the Double White Daffodil of Constantinople (or Double Roman) as follows:—"This Daffodil differeth very little or nothing in leaf from the former; the only difference is in the flowers, which, although they be double and bear many upon a stalk like unto them, yet this has the pieces of the yellow cup tipped with purple, as if they were shread or scattered among the white leaves, whereas the other hath only the yellow without any show of purple tips among them; the smell of this is as strong as any other." This curious and desirable form is now, unfortunately, lost to cultivators. It was doubtless a double-flowered form of one of the hybrid or intermediate varieties of *N. poeticus* and *N. Tazetta*, which we know exist in a wild state. Dr. Henon, who carefully studied the French *Narcissi*, says:—"The station of Lattes, near Montpellier, is remarkable in that it offers many species mixed in the same meadow." These species are *N. poeticus*, *N. Tazetta*, and *N. biflorus*, all of which are connected by a series of hybrid or intermediate forms.

The above are all the double Daffodils with which I am acquainted; but there are doubtless others, and of these some account would be acceptable. B.

Coleus Chameleon.—The most remarkable *Coleus* now in cultivation is the variety called Chameleon. The rich tints of pink, rose, green, white, and magenta which this plant presents make up, perhaps, the most extraordinary combination of colour to be found in any plant. During the early fall of 1873 this plant was (according to Mr. Chitty, writing in the "Rural New Yorker") introduced into England, and twice during the past summer specimens were exhibited before the Royal Horticultural Society, where certificates of merit were awarded it, and where it was so much admired as to form the centre of attraction on each occasion. *Coleus Chameleon*, recently re-christened in England *Coleus* Duchess of Edinburgh, is a most charming plant for outside decoration in summer. I have during the past summer and early autumn seen some splendid specimens, which were most brilliantly coloured and growing outside without protection from the sun. One plant was quite 4 feet high, and the colouring of its foliage was as rich and varied as any that I ever saw under glass.

DAFFODILS.

I WANDER'D lonely as a cloud
That floats on high o'er vales and hills,
When all at once I saw a crowd,
A host of golden Daffodils;
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze.
Continuous as the stars that shine
And twinkle on the milky way,
They stretch'd in never-ending line
Along the margin of a bay:
Ten thousand saw I at a glance,
Tossing their heads in sprightly dance.
The waves beside them danced, but they
Outdid the sparkling waves in glee:—
A poet could not but be gay,
In such a jocund company:
I gazed—and gazed—but little thought
What wealth the show to me had brought:
For oft when on my couch I lie,
In vacant or in pensive mood,
They flash upon that inward eye
Which is the bliss of solitude,
And then my heart with pleasure fills,
And dances with the Daffodils.

—WORDSWORTH.

ROSE SHOWING v. ROSE GROWING.

I HAVE often wondered whether or not promoters of Rose shows take into consideration the proportion that Rose prizes bear to those offered for other garden produce that goes to make up an exhibition. So large a share of the funds do Roses monopolise that numerous deserving specimens of other kinds have to be passed over or, what is perhaps worse, receive so slight an acknowledgment as just to indicate that the judges have looked at them. Vegetables, as a rule, are considered beneath the notice of such meetings, and only fit to grace the tables of cottagers' shows. If it could be proved that Rose shows promoted improved systems of growth the amount given away in prizes for Roses would be well expended; but that is not the case. On the contrary, such encouragement only tends to perpetuate a system of growth wholly at variance with the natural beauty of some of the best Roses which we possess. The usual competitors are nurserymen who have hundreds of one and two-year budded plants to choose from, and a few gardeners and amateurs who convert their kitchen gardens into Rose nurseries, where Roses to supply blooms for competition may be seen like rows of inverted mops, one or two buds being left on each, and certainly anything but interesting, except in the eyes of the enthusiastic Rosarian who sees in the single truss elements of beauty which a more casual observer would only see in a fully-developed bush. Yet such is the custom, and year after year the best prizes go to "A," as it is well known that no one else can successfully compete under the circumstances. Such prizes are not offered for the most advanced system of Rose culture in general, but for single blooms, or clusters of bloom, at a given date. I have sometimes inquired of the secretaries of flower shows why so large a portion of the funds subscribed to encourage good gardening should be devoted to any one particular branch, to the exclusion of more useful objects, and the invariable reply has been that so much interest is always manifested in the Rose contest that it is considered to be the best part of the show. My impression, however, is that the amount of the prize money imparts to the contest between the rival exhibitors more excitement than admiration for the size or symmetry of the blooms. The question, therefore, arises, what are the good results of such shows? Rose-growing, in the true sense of the term, is not encouraged by such lavish outlay of money. I admire beds, banks, or pillars of Roses, but not standards, which, as usually seen, are the most unnatural-looking objects now tolerated in gardens; and, being usually planted in straight rows, it becomes almost a compulsory matter that they should be all pruned alike, in order that the heads may correspond as to size. The consequence, therefore, is that, like spur-pruned Vines, while some, as in the case of Hamburgs, are fruitful at every bud, others, like the Barbarossa, only produce wood. Nevertheless, while Rose-showing is encouraged as it now is, standards will continue to be the rule; and more graceful modes of growing the Queen of Flowers the exception.

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NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Carpet of Flowers and Ivy.—Nothing looks prettier just now than Primroses coming through a sheet of Ivy round the more open parts of shrubberies. Old Hyacinth bulbs, Solomon's Seal, Ferns, and Violets all do well in a groundwork of Ivy. The shrubs are also much more healthy for the quiet enjoyed by their roots, and if one happens to show a bare stem the Ivy carpet has a remarkable effect of preventing it from looking unsightly.—A. Dawson, *The Cedars, Chiswick*.

Raising *Chamaepeuce diacantha*.—This interesting Thistle gives me considerable trouble, for I cannot get it up. I saw it at Battersea, and was so much struck with it that I made my mind up to make all my neighbours envious by its possession. I have got (to my thinking) the most artistic and elaborate designs for my flower beds for this year, and *C. diacantha* is the principal figure, but, as yet, the plant is obdurate. How am I to get it up? It is sown in a pan and placed in the propagating-house in a brisk growing temperature.—N. H. P.

Hardiness of *Sparaxis pulcherrima* in Northumberland.—As some seem to doubt whether this is quite hardy I may state that I have two plants of it that have stood the two last winters in my garden, as far north as Northumberland. During the late long and very severe winter they had no protection whatever, and now they are shooting up quite fresh. I may add that *Agapanthus umbellatus* has been planted out in my garden for many years without any protection in winter, and I have also seen it planted out much further north than here. Grown in the open air the blue of the flower seems deeper and more charming than when grown under glass.—G. F.

***Primula vulgaris* var. *Vesuvius*.**—The description and engraving which you gave of this beautiful but variable variety (see p. 319) are highly interesting. I first became familiar with it through a coloured figure on Plate 14 of Hale's "Eden or Compleat Body of Gardening," a valuable old folio work containing sixty coloured plates, published about a century ago. It is there figured as the "Polyanthous Primrose," and at p. 158 it is said to be a native of Turkey, and full directions are given with regard to culture. The concluding lines run thus:—"Let him [the cultivator] save the seed from the choicest of these flowers. In this way he will continue improving his stock, and by such Methods there is no Saying to what Excellence this kind may be raised." It may be added that the coloured figure represents the plant just as you have illustrated it; therefore the improvement suggested does not appear to have been effected.—B.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Kitchen Garden.—A sowing of French Beans may now be made on a warm border. It is not, however, advisable to put in many until the beginning of May, as they are liable to be injured by the weather. Neither is it advisable to sow at all until May, where the land is of a cold retentive nature; but in such localities, when this vegetable is particularly desired early, a fortnight may be gained by at once planting a couple of Beans in 48-sized pots, and keeping them under glass until the third week in May, after which there will be little danger from frost. At this early sowing do not cover the seed more than an inch, for if sown deeply and the weather becomes very wet, it will rot. The Paris Red Flageolet is one of the best of dwarf Beans, being good in quality and a heavy cropper. A few runner Beans may also now be sown in a dry situation; but do not at present risk too many. They are generally grown in rows 6 feet apart, on tall sticks; but it is not necessary that they should have sticks of great length, unless where these can be procured at little or no cost. Ordinary Pea-sticks, say 4 feet in height, will answer very well, pinching off the points of the shoots as soon as they get to the top of the support, and in this case the rows do not need to be more than 4 feet apart. They will, however, do well without any sticks. If the rows are planted 3 feet apart, the seed 9 inches asunder in the rows, and they are simply allowed to lay on the ground, they keep breaking out and flowering all through the season, and the quantity of Beans which they produce would not be credited by those who have not seen them grown in this way. A few more Turnips may now be sown, and for the general crop none are better than the Red-topped American Stone, already recommended for the earliest sowing. As with most other vegetables, it is much the best practice to grow Turnips in rows; sowing in this way takes a little more time, but any loss in this way is saved many times over by the facilities given for the use of the hoe in place of hand-weeding, which must in a great measure be resorted to where such crops are sown broadcast. Another sowing of the different sorts of Broccoli before advised should now be made; also one of Cauliflower, both Summer and Veitch's Autumn Giant. More Lettuces should likewise be at once sown; and now, and all through summer, these should be sown in rows where they are to be grown. The ground for them should be well manured; the rows should be 15 inches apart, the seeds put in thinly, and, when large enough to handle they should be thinned out to a foot or 15 inches apart. Another sowing of Broad Beans may be made where these are required late, but such as are put in now will not bear so well as those sown earlier. Pot Marjoram, Sweet Marjoram, Thyme, and Sage should now be sown on ground previously well prepared for them by fine raking, as owing to the seeds being so small they would be lost if the surface was rough; after raking, smooth the surface with the back of the spade, then sow the seeds and cover lightly with sifted soil. A little Beet may now be sown for an early supply, but do not yet sow the principal crop, as it is liable to run to seed if sown early. Sow in ridges 15 inches apart; where the soil is shallow it may be drawn into ridges about 6 inches high, and on these sow the seed, four or six together, in shallow holes a foot apart, covering them not more than half-an-inch deep. A little more Cabbage seed should also be sown, using on this occasion the small-growing Cocoa-nut, a kind which comes to maturity quicker than the larger varieties—these will form good heads for use all through the autumn, planted on ground on which the first Potatoes and other early crops have been grown. One of the principal things to be observed in a well-managed kitchen garden is to always have in readiness something to plant in the places of such crops as have just been cleared off. Keep the hoe going wherever it can be used when the weather is dry. The ground occupied by Gooseberries, Currants, and Raspberries should be well hoed before weeds attain any considerable size.

Flower Garden.—The beds not filled with spring-blooming plants should now be prepared for their summer occupants. The first thing to determine is what plants are to occupy each bed, which should be treated according to their respective requirements; for instance, Pelargoniums will not do well in over rich soil, which would cause them to run to leaf, instead of flowering freely; Verbenas and Calceolarias like it moderately rich, with an addition of new loam and leaf mould, if the old soil has become at all exhausted; for Alternantheras it can scarcely be made too rich; if the ground as far as their roots extend consists of one-fourth rotten manure they will attain double the size which they otherwise would do, and be much higher coloured than if planted in poor ground; for all the larger-growing, deeper-rooting plants get a good portion of the manure well down to the bottom, as deep as the soil is stirred; this is important, especially in dry situations, as, when roots have a store of food buried deeply below the surface, the plants receive such support as will enable them to keep on growing through a dry period in a way

which they cannot possibly do if their principal nourishment lies near the surface. Thoroughly pulverise the soil, but do not make it smooth on the top, for mere appearance sake, as, if for the next fortnight it lays sufficiently open to permit sun and air to penetrate it, it will be in a much better condition for planting than it otherwise would be.

Pits and Frames.—Sow in pots, in a gentle heat, some ridge Cucumbers for planting out. It is not good practice to sow these before this time, as they should not be turned out before the end of May or the first days in June; and, if sown too early, they get stunted before being put out, a condition from which they take some time to recover. A few more seeds of Vegetable Marrow may be put in, in case any mishap should befall those first sown. Give abundance of air to bedding plants such as Verbenas, Ageratums, Calceolarias, Heliotropes, and Pelargoniums. Where they are large and strong, the lights may be taken quite off in the middle of the day. All bedding plants in pots, especially if the latter are small and very full of roots, should be well supplied with water. In order to make sure of this, they will require looking to twice a day in sunny weather; for, if allowed to get very dry, they become hard and stunted, and are weeks, after being planted out, before they begin to grow freely.

Glasshouses.—Plants in the stove will now be in active growth. *Euphorbia jacquiniiflora* for winter flowering should be propagated, taking the young shoots off with a heel when six inches long and putting them eight or ten round the sides of 6-inch pots, two thirds filled with sandy loam, the remainder being sand; cover them with propagating glasses until rooted, then remove them singly into 48-sized pots. Plants of this *Euphorbia* that have flowered and been cut back when they have made young shoots a couple of inches long should be taken out of their pots, a good portion of the old soil removed, re-potted, and placed in the stove to make growth. Everyone possessing a house devoted to plants that require heat should grow the lovely sweet-scented *Stephanotis*; it is a general favourite, and does not require so much heat as many other stove plants; it will succeed where a winter night temperature of 50° is kept up, or even a few degrees lower. For amateurs I should advise its being grown in a large pot—15 or 18-inch—placed in one corner of the stove, and trained permanently on wires over the path near the glass; in this way it is in the best position for ripening its growth, without which it does not flower freely. *Bougainvillea glabra* will now be growing fast and shortly showing its flowers; assist it with manure-water every other time it is watered. *Clerodendron Balfourii* will also now require similar treatment. Like the *Stephanotis*, both these plants may be grown where there is not sufficient heat kept up for such subjects as *Ixoras* and *Dipladenias*, which do not succeed well unless in strong heat. *Rondeletia speciosa* is another good plant for amateurs to grow; it is easily managed, will succeed in either peat or loam, and is a free bloomer, producing neat red bunches of flowers from the point of every shoot. It is very useful for cutting, and the plant is not injured thereby. *Gardenias* should now be pushing up their flowers; do not give them either too much or too little water, for they are apt to shed their bloom buds. When cutting at this season, the flowers should be gathered when half open, or they lose their colour. Those useful summer-flowering plants, *Achimenes* and *Gloxinias*, will now be making free growth; give them plenty of light, with a little shade, in sunny weather. Attend well to *Gesnera zebrina* and *exoniensis*, for autumn flowering. Such things as *Caladiums*, *Marantas*, *Sphærogyne latifolia*, *Cyanophyllum magnificum*, and similar plants, will now require shade, or they will have a rusty appearance. Syringe freely in the afternoons, and keep up a moist atmosphere. Look well to the timely destruction of such insects as scale and mealy bug, which, if once allowed at this season to get ahead, are most difficult to eradicate, and they destroy the appearance of the plants. Ferns will now be making their principal growth, and will require some shade and plenty of water, but do not keep them too much darkened or too hot, or they become so soft as to be of little use for cutting. Nothing is more tantalising than to see the Ferns in a bouquet or a vase of flowers shrivel up in a short time after they have been arranged, which never need occur if they are not grown in a way to make them soft and tender. Close the stove early in the afternoon whilst the sun is still above the horizon, sun-heat being better, as well as cheaper, than fire-heat.

Variegated Laurels.—More than one of my Laurels have shown a disposition to put forth variegated leaves. From one of them in particular—a very old one—the terminal leaves are cream-coloured, and at first are delicate and pretty, but they soon degenerate and become rusty on the edge. Some of the lower leaves on the same branch are variegated, i. e., green splashed with white. I have layered some of the branches, but I scarcely expect to obtain a permanent variety from them. Mr. Davidson, the notice of whose experiments at Strathfieldsaye in your paper of the 10th inst. has led me to address you on this subject, may, I trust, be more successful.—C. B. H.

HENDERSON'S WINTER-FLOWERING AMARYLLIS.

(AMARYLLIS (HIPPEASTRUM) HENDERSONI COCCINEA.)

THIS is one of a superb group of varieties raised by Messrs. E. G. Henderson, from *Hippeastrum pardinum* in 1873. It is a great improvement on the parent type, which it much exceeds in size and richness of colour. In style of growth it is stately and robust, producing its bloom freely in a warm conservatory or greenhouse during the mid-winter months. Its large open-lobed funnel-shaped flowers, with a conspicuous green starry ray in the centre, are from 6 to 9 inches in diameter. The predominant colour, as will be seen by the accompanying illustration, is a rich velvety-maroon-crimson over three-fourths of the surface, finely contrasted with creamy-white. The crimson ground partially extends beyond the main body colour by diverging into separate crimson veins or lines, and also as a narrow belt of the same rich colour along the side margins, the intervening spaces being thickly sprinkled with crimson spots; beyond these each petal terminates in a broad ovately-oblong creamy-white tip, which imparts a bold and agreeable relief to the otherwise striking display of colour in this unusually showy variety. Its period of blooming under a much cooler atmosphere than that required for the tropical section of *Amaryllis*, renders it a valuable acquisition for decorative plant groups at a period of the year when plants possessing showy colours are most valued.

OPEN-AIR VEGETATION AT THE ROYAL BOTANIC GARDEN, EDINBURGH.*

FEB. 11.—The past winter has been remarkable for its severity, particularly during the month of December last, when the thermometer was observed on twenty-seven mornings at or below the freezing point. The lowest markings were on the mornings of the 15th, 23rd, 25th, 28th, 29th, and 30th, indicating respectively 17°, 18°, 17°, 13°, 5°, and 15°, whilst the highest night temperatures were on the 1st, 4th, 5th, and 6th, indicating 33°, 33°, 40°, and 38°. The united morning frosts during that one month amounted to 277°, being 31° more than was registered throughout the whole of the winter months last year, which was 246°, and of this number 36° only were recorded during the month of December. The last very severe frost experienced at Edinburgh was during December, 1860, when the united degrees of frost that month amounted to 267°; although the amount is 10° less than in December last year, the mischief done to vegetation was very much greater. The lowest point indicated during the winter of 1860 was minus 5°, being 10° less than was indicated during last December. After the disappearance of the frost on January 1, the weather for some time was dull, and comparatively little injury to vegetation has as yet been observed; had the weather been clear and sunny, vegetation, in all probability, would have shown greater damage. Some plants, however, have suffered considerably. A few points of the *Cupressineæ* were observed to be a little browned, particularly in low situations. The leaves of the Golden Queen Holly were also much discoloured. The Green Hollies, particularly the tree forms, have parted with a large quantity of their leaves. The *Phormium tenax*, or New Zealand Flax, as well as the *Cordyline angustifolia*, have suffered severely. Many of the latter plants have stood unprotected on the rock garden during the last five years, some having attained the height of 6 feet. During December, 1870, we had 168° of frost, and several of the *Cordylines* at that time were killed to the ground, but again pushed up from the lower portion of the stem, and afterwards became fine plants; hopes are, therefore, entertained that the injured specimens will all break out again, the plants being considerably stronger than they were when last damaged. In consequence of a coating of snow being on the ground during the severest frost, it will be some time before the mischief done to herbaceous vegetation can be known. During last month (January, 1875) the thermometer was fourteen times at or below the freezing point, indicating together 73°, while the previous January (1874) only indicated 32°. During the past month the lowest mark-

* Papers read at meetings of the Edinburgh Botanical Society. By Mr. James McNab.



FENDERS' WINTER-FLOWERING ANARTHEUS.

A. fendersi coccinea. (Fort.)

ings were on the mornings of the 1st, 8th, 23rd, 25th, 26th, and 30th, indicating 13°, 26°, 28°, 29°, 25°, and 26°, while the highest morning markings were on the 10th, 11th, 14th, 16th, 19th, and 28th, indicating 38°, 39°, 39°, 42°, 42°, and 44°. Owing to the severe frost experienced during December, 1874, vegetation has been very much retarded. The following plants have bloomed in the open air during the month:

Jan. 15. <i>Corylus Avellana</i>	Jan. 21. <i>Veronica alpestris</i>
" 18. <i>Galanthus nivalis</i>	" 23. <i>Crocus susianus</i>
" " <i>Tussilago fragrans</i>	" " <i>Scilla præcox</i>
" 20. <i>Primula denticulata</i>	" 24. <i>Crocus Imperati</i>
" " <i>Erica herbacea alba vera</i>	" 25. <i>Hepatica angulosa</i>
" 21. <i>Hepatica triloba</i>	" 30. <i>Eranthis hyemalis</i>
" " <i>Leucojum vernum</i>	

On the first day of January this year the only open-air flowers that could be procured were *Jasminum nudiflorum*, four species of *Helleborus*, and *Gentiana acaulis*; while on January 1, 1874, no fewer than 138 specimens and varieties were collected in bloom.

March 11.—February has been exceedingly cold, easterly and north-easterly winds having prevailed during a considerable part of it. Snow set in on the 23rd and continued to lie during the remainder of the month, and up to the 11th of March snow was still to be seen on the northern slopes of the neighbouring hills. On twenty-one mornings the thermometer was at and below the freezing point, indicating altogether 75°, the lowest markings being on the mornings of the 4th, 5th, 10th, 12th, 17th, and 24th, indicating 21°, 16°, 20°, 27°, 28°, and 28°, whilst the highest morning readings were on the 1st, 2nd, 7th, 13th, 14th, and 16th, indicating 43°, 35°, 34°, 37°, 41°, and 35°. Owing to the long-continued and comparatively low temperatures experienced during the month, vegetation is very far behind; none of the plants noticed as being in flower in March last year are yet in bloom, and, with the exception of the *Crocus vernus*, *Bulbocodium vernum*, and *Mandragora vernalis*, no others noticed at the February meeting last year are yet out. Although the *Crocus* showed its first flowers on the 10th of February, very few have yet come forward, and even the *Snowdrop* can scarcely be said to be yet in perfection. At the March meeting last year specimens of *Ribes sanguineum* were shown in bloom, while this year the plants are still in their winter condition, the buds only swelling. Deciduous trees are also very far behind. The following is a list of the open-air plants as they came into bloom during the month of February:

Feb. 2. <i>Cyclamen coum</i>	Feb. 10. <i>Crocus vernus</i> and vars.
" " <i>Primula vulgaris rubra</i>	" 15. <i>Aubrietia grandiflora</i>
" " <i>Iberis gibraltaria</i>	" " <i>Primula purpurea</i>
" 3. <i>Galanthus plicatus</i>	" " <i>Tussilago alba</i>
" 4. <i>Rhododendron atrovirens</i>	" 16. <i>Knappia agrostidea</i>
" " <i>Daphne Mezereum</i>	" " <i>Saxifraga oppositifolia</i>
" 5. <i>Dondia Epipactis</i>	" " <i>alba</i>
" 6. <i>Bulbocodium vernum</i>	" " <i>Arabis procurrens</i>
" 8. <i>Erica herbacea</i>	" 28. <i>Mandragora vernalis</i> .
" 10. <i>Arabis albida</i>	

April 8.—The early part of March was cold, with easterly and north-easterly winds, which, with the cold of the previous months, have been the means of greatly retarding vegetation. Only on ten mornings was the thermometer at or below the freezing point, giving altogether 45° of frost, being 8° more than was registered during the month of March last year. The six lowest registrations were on the mornings of the 4th, 5th, 6th, 10th, 11th, and 12th, indicating respectively 27°, 24°, 28°, 25°, 24°, and 25°, while the highest morning temperatures were on the 8th, 22nd, 25th, 26th, 30th, and 31st, indicating respectively 45°, 42°, 46°, 45°, 42°, and 42°. During the month many open air spring plants have come into bloom; these being chiefly on the rock garden, a list of them is annexed in the order they came into flower. Many of the species are fully three weeks later in blooming than they were last year. The *Ribes sanguineum* showed its first flowers this year on the 30th of March, while last year it was recorded as flowering on the 3rd—a particular plant being fixed on for annually recording its blooming. At the February meeting I stated that several of the Conifers, particularly those of the Cupressineæ group, had suffered from the effects of the frosts experienced during the past winter. The few sunny days we had during the latter part of the month have told on several other species, but chiefly on those from the Eastern hemi-

sphere; several have been much disfigured, particularly the *Cupressus torulosa*, *C. cashmerensis*, *C. sempervirens*, *Thuja orientalis pygmæa*, *T. triangulare*, *T. gracilis*, *Cupressus Knightii*. The variegated portions of the *Cupressus Lawsoniana*, both gold and silver varieties, have been much injured, but no others of the *Lawsoniana* group, all the varieties being exceedingly healthy, and showing more flowers than they have done for many years. The *Abies* tribe in general have stood well, with the exception of the British seedlings of *Abies Menziesii* and the *Abies Douglasii*, both kinds being very much browned, particularly where growing in exposed situations; the variegated variety of the *Abies Douglasii* has suffered severely, both in exposed and sheltered places. Of the *Piceas*, the *P. lasiocarpa* is very much discoloured, as well as the British seedlings of *Picea nobilis*. Amongst the genus *Pinus*, *P. tuberculata*, *P. uncinata*, *P. insignis*, *P. brutia*, *P. patula*, and *P. Don Pedro*, are also browned, as well as the golden variety of the *Pinus sylvestris*. The arboreous vegetation of the deciduous class is this year very far behind. On the 31st of March, the Elm, Willow, Alder, Hazel, and Poplar, were in flower, and a few green leaves were to be seen on the Lilacs, Crab Apples, *Mespilus canadensis*, and some of the Thorns in sheltered situations; with these exceptions, all other trees may be said to be in their winter condition, although a slight swelling of the buds is here and there visible on the Planes and Horse Chestnuts. It is now evident that the *Cordyline australis*, *Phormium tenax*, *Gynerium argenteum*, *Arundo conspicua*, and *Tritomas* (particularly the *T. Burchellii*), have suffered severely, although none of them are killed. List of plants as they came into bloom during the month of March:

Mar. 1. <i>Primula purpurea</i> .	Mar. 19. <i>Saxifraga oppositifolia</i>
" 4. <i>Potentilla alba</i>	" " <i>bryoides</i>
" 6. <i>Sisyrinchium grandiflorum</i> album	" " <i>Iris reticulata</i>
" " <i>Tussilago nivea</i>	" 20. <i>Aponogeton distachyon</i> (in pond)
" " <i>Saxifraga Rocheliana</i>	" " <i>Scilla bifolia rubra</i>
" " <i>Leucocoryne alliacea</i>	" 21. <i>Erythronium grandiflorum</i>
" " <i>Doronicum caucasicum</i>	" " <i>Gagea lutea</i>
" 7. <i>Scilla bifolia vera</i>	" 22. <i>Corydalis tuberosa</i>
" " <i>Corydalis angustifolia</i>	" 23. <i>Scilla bifolia patula</i>
" 8. <i>Draba aizoides</i>	" " <i>Puschkinia scilloides</i>
" " <i>Primula marginata</i>	" " <i>Omphalodes verna</i>
" " <i>Sisyrinchium grandiflorum</i>	" 24. <i>Merendera caucasica</i>
" " <i>Triteleia uniflora</i>	" " <i>Orobis cyaneus</i>
" 10. <i>Scilla sibirica</i>	" 26. <i>Muscari botryoides</i>
" 11. <i>Nordmannia cordifolia</i>	" " <i>Rhododendron caucasicum</i>
" 13. <i>Narcissus pumilus</i>	" 27. <i>Muscari b. album</i>
" " <i>Rhododendron Noble-anum</i>	" " <i>Hyoscyamus Scopolia</i>
" 14. <i>Scilla bifolia major</i>	" 28. <i>Muscari b. pallidum</i>
" 16. <i>Saxifraga oppositifolia pyrenaica</i>	" " <i>Orobis elegans</i>
" " <i>Saxifraga oppositifolia retusa</i>	" 29. <i>Adonis vernalis</i>
" " <i>Saxifraga juniperina</i>	" " <i>Primula villosa</i>
" 17. <i>Scilla bifolia alba</i>	" 30. <i>Epigæa repens</i>
" " <i>Draba cuspidata</i>	" " <i>Primula nivalis</i>
" 18. <i>Narcissus minimus</i>	" " <i>Draba altaica</i>
" " <i>Rhododendron præcox superba</i>	" " <i>Ribes sanguineum</i>
" " <i>Saxifraga oppositifolia grandiflora</i>	" " <i>Symplocarpus foetidus</i>
	" 31. <i>Symphytum caucasicum</i>
	" " <i>Hyoscyamus orientalis</i>
	" " <i>Erythronium Nuttallianum</i>

THE BEST MORTAR FOR GARDEN WALLS.

FROM a valuable little work on engineering,* by Mr. C. Graham Smith, we extract the following remarks on mortar making, which may be of use to gardeners concerned with the erection of buildings:—"To obtain good mortar, as much depends on the character of the ingredients and the manner of mixing them as on the goodness of the lime itself; it does not necessarily follow that because a lime is good the quality of the mortar will be good also; the best lime ever burnt would be spoilt by the custom, common among builders, of mixing with it alluvial soil and rubbish taken from the foundation pits of intended buildings. The sand should be hard, sharp, gritty, and, for engineering purposes, not too fine; it should be perfectly free from all organic matter, and with no particular smell; good sand for mortar may be rubbed between the hands without soiling them.

* "Engineering Papers." By C. Graham Smith, Stud. Inst., C.E., &c. London: E. & F. N. Spon, 48, Charing Cross.

The water also should be free from all organic matter, and on this account should never be taken from stagnant ponds. The presence of salt in sand and water is not found to impair the ultimate strength of most mortars, nevertheless it causes the work to nitrate, or, as it is commonly termed, saltpetre, which consists of white frothy blotches appearing on the face of the structure; it also renders the mortar liable to moisture, and for these reasons should never be present in mortar intended for architectural purposes, although for dock walls and sea works it may generally be used with advantage and economy. Sand is used to increase the resistance of mortar to crushing, to lessen the amount of shrinking, and to reduce the bulk of the more costly material, lime. Water is the agent by which a combination is effected, and as sand does not increase in volume by moisture, it necessarily follows that no more of the aqueous element should be employed than is absolutely necessary to fill the interstices between the sand, and render the whole into a paste convenient for use; and the greater strictness with which this is adhered to the more compact and durable will be the mortar." Two other papers, containing many excellent hints, one upon "Practical Iron Work," and the other upon "Retaining Walls," are contained in the volume.

TOBIN'S SYSTEM OF VENTILATION.

NOTWITHSTANDING the stress laid upon pure air by all sanitary reformers, the endeavours of architects to obtain the blessing have almost always made shipwreck upon the draughts which they occasioned, and upon the lowering of temperature which they have caused. These endeavours, moreover, have generally been guided by the entirely erroneous assumption that vitiated air, being heated, would not only ascend, but would also escape through outlets in the upper part of a chamber. When such outlets are made, the heavier cold air descends through them, pushing aside that which is lighter and warmer, often forcing it back through presumed inlet openings, and coming down in a stream, like water poured out of a jug, upon the heads of any unfortunates beneath. So completely has scientific ventilation been at fault that nearly every contrivance for the purpose, when applied to inhabited rooms, has produced chill draughts which were more unpleasant, and even more immediately pernicious, than vitiated air itself, and has induced the dwellers to stop up the openings with the least possible delay. The practical result has, therefore, been that our houses, and especially our rooms used for public purposes, are not ventilated at all. The means, however, of rendering the atmosphere of any chamber as pure as that outside the building, without improper lowering of temperature, and without the production of draught, has recently been discovered, and has been brought into practical application, by Mr. Tobin, a retired merchant, who lives in the neighbourhood of Leeds. Mr. Tobin's own account of the matter is that he was once watching a current of water which flowed into a still pond. He observed that the moving water kept together, and held its own, until its course was arrested by the opposite bank, when it curved gently round on either side, and was lost insensibly in the general body, which had its outlet for overflow at one side. He reflected that a current of air introduced into a room would act in precisely the same manner, keeping together until it encountered an obstacle, then mixing insensibly with the air around it, and compelling an overflow wherever there was an opening available. He saw that, if this were so, it would only be necessary to give the entering current an ascending direction, so that it would reach the ceiling without impinging on any person, in order to solve the problem of domestic ventilation. Experiments at his own house confirmed his anticipations, and led him to contrive methods, which he has patented, of carrying his principle into practice. At that time the state of the Borough Police Court at Leeds was, as, indeed, it had been for some time previously, a source of great perplexity to the Town Council. The Court is one of a series of rooms which surrounds the Town Hall, and the doors opening into it are three in number—one leading from a corridor which gives access to the public, one leading into the magistrates' retiring room, and one from the cells into the dock. Light is admitted only by a window in the roof, and in this skylight there is an opening, intended for the exit of foul air, but practically serving for the entrance of fresh air. The Council had expended between £1,400 and £1,500 on successive ventilation doctors, each of whom had left matters as bad as, if not worse than, they were before. The subject was one of continual comment in the local papers, but the council had begun to despair of a remedy, when Mr. Tobin offered to supply one. He suggested that the Council should pay him a nominal royalty for the use of his patent, and that they should pay the few pounds required for doing the work, leaving his own remuneration to their discretion when they saw the effect. These terms having been accepted, Mr. Tobin placed

under the floor of the court three horizontal shafts which communicated with the open air through a cellar grating. From these he brought eight vertical shafts through the floor at different points. These vertical shafts rise about 4 feet above the floor, and are each 5 inches in diameter. They have open mouths, and are placed out of the way in corners, or against the partitions of the court. From each shaft there ascends to the ceiling an unbroken current of the outer air, like a fountain, or like a column of smoke when the barometer is high. The current will support feathers, or wool, or other light substances, and has so little tendency to spread laterally that it can be made to influence half the flame of a candle, while the other half remains undisturbed. A person resting his cheek against the margin of one of the tubes feels no draught, and the hand feels none until it is inclined over the orifice. The effect was instantly to render the court as fresh and sweet as the external air around the building. The steady flow of the eight ascending currents constantly rinsed out, so to speak, the confined space, and washed away the effluvia of dirty people, and the products of respiration, as fast as they were liberated, forcing them out through the skylight opening which was previously only an inlet, but which was altered in a manner to facilitate egress. After three months' trial, and after all the magistrates for the borough had joined in the report, which expressed their entire and unmixed satisfaction, the Corporation voted Mr. Tobin an honorarium of £250, to express their sense of the benefit which he had conferred upon the town. They also applied his system to the council chamber; and their example was followed by some of the leading bankers and merchants, by the churchwardens of St. George's Church, and by the proprietors of the "Leeds Mercury," who have had every room and office in their spacious premises ventilated, under Mr. Tobin's superintendence, and who have expressed, in two or three descriptive articles, the entire success which has been obtained. The system of vertical tubes is necessary for rooms which have no side windows, or which have only a small window surface in proportion to their cubic contents. But Mr. Tobin at the same time contrived a cheap and simple method, by which vertically ascending air currents can be introduced through common window sashes; and this method will suffice for all ordinary living or sleeping apartments. Each of the openings made for this purpose is provided with a cover by which it can be closed at will; and they admit of a method of securing the sashes which affords almost entire security against burglars. A very competent authority has communicated to us his experience for eight weeks of a room containing 2,500 cubic feet, ventilated, under Mr. Tobin's direction, by four window openings which have an aggregate area of 30 square inches, but which are filled by layers of cotton wool to filter the entering air from dirt and moisture. The currents ascend in absolute contact with the glass, keeping so closely to it that they do not affect the flame of a taper which is held vertically in contact with the sash bar; although, as soon as the taper is inclined towards the pane its flame is strongly fluttered. In this way the air ascends to the top of the window, where it is directed to the ceiling and lost as a current, being no longer traceable by taper, hand, or fragments of down, although closing the window openings diminishes, in a marked manner, the draught up the chimney. Each opening, as already described, has an independent cover, and, without the wool, the four would, in cold weather, be too much for a room of the size specified. With the wool they do not perceptibly diminish the temperature, but they give a feeling of absolute out-of-doors freshness, which must be experienced in order to be appreciated. There is no draught anywhere, and the openings are not visible unless sought for, so that curious inquirers, who have remarked on the result, have been unable to find the inlets. Arranged as described, the openings are sufficient to feed a large argand table gas burner, and to sweep away entirely the products of its combustion; so that, when the room has been shut up, with the gas lighted and with a good fire, for three or four hours, persons entering it from the open air are not able to discover, except by the greater warmth, any change of atmosphere. A bed-room, ventilated in a similar manner, is as fresh when the door is opened in the morning as when it was closed at night. Mr. Tobin's experiments early led him to the conclusion that the prevailing notions about the necessity for carefully-planned outlets were fallacious, and that, if proper inlets are provided, the outlets may generally be left to take care of themselves. In order to test this he fitted two vertical tubes into a small room, which had a fireplace and a three-light gas pendant. He closed the opening of the fireplace, and every other opening into the room except the tubes, hermetically, and, shutting himself within, pasted slips of paper all round the door. He found that there was then no entrance current by the tubes. The room had no outlet; it was full of air, which his respiration had not had time to consume in any appreciable quantity, and no more could get in. He next lighted the three gas burners, and a steady entrance current immediately set in through the tubes,

and continued as long as the gas was burning. He waited nearly an hour without any deterioration of the atmosphere becoming susceptible to his senses, and with the currents steadily coming in and ascending in their customary manner. He then cut through the paper which secured the door, and left the room, shutting the door behind him. Returning half an hour later, he found the atmosphere still fresh. He next extinguished the gas, and the currents gradually died away, the original state of equilibrium or fulness being restored. This experiment, which has been several times repeated, seems to show that the external air will enter just in proportion as room is made for it by combustion or respiration, and that the rate of supply is essentially governed by the rate of destruction or demand. In the closed room the water produced by combustion would probably be condensed, and the heavy carbonic acid would sink to the floor. If the combustion continued indefinitely, the accumulation of these products would in time render the air "irrespirable;" but that time would be much longer in coming than is generally supposed, and, for all practical purposes, the chimney throat is everywhere sufficient as an outlet. The rationale of the matter appears to be that when the external air communicates with that of a room through a channel which terminates in a vertical shaft, an inward current is produced as soon as the air of the room is either rarified by warmth or partially consumed by respiration or combustion. This inward current is due to the pressure of the external atmosphere, which is capable of driving the entering air, in a compact column, to a considerable elevation. The whole pressure of the atmosphere is equal to rather more than 14 lbs. on each square inch; and this force would be all exerted if the chamber into which the air was to be driven was itself a vacuum. As it is, the pressure exerted will always be determined by the difference between the atmospheric density within and without the chamber; and hence, the more the internal air is rarefied or consumed, the greater will be the force of the entering current. It follows that the supply of air adjusts itself automatically to the demand, and that the inlets should always be sufficient for the maximum requirements of the room to which they are applied. However large they may be, they will not admit air in excess of the rarefaction or combustion of that which is already there; and, as rarefaction and combustion diminish, the number of cubic feet passing through the inlets in a given time will diminish in precisely the same ratio. In order to obtain an absolutely perfect result it is necessary to bear in mind that the behaviour of the entering current will be precisely like that of the vertical column of water sent up by a fountain, except that, as the ascending air is received in a fluid of only little less density than its own, it will mingle with that fluid gradually when the propulsive force is exhausted, instead of falling almost vertically by the action of gravity. But just as a fountain, if it encountered an obstacle while its column was still compact, would rebound from that obstacle with considerable violence, so the entering current of air, if it meets with an impediment prematurely, will be reflected as a draught. We have seen this very well exemplified in a room at Leeds, in which the construction of the windows rendered it necessary to make the inlets much higher up than usual, and in which, when the force of the entrance current was increased by lighting gas, a very distinct stream of cold air was reflected from the ceiling. To prevent such an occurrence, it is necessary to make the inlets so low down that, under all ordinary circumstances, the force of the stream will be expended before the ceiling is reached; and when, from any circumstances, this cannot be done, the current may be broken by strainers of wire gauze or other suitable material. In this, as in most other matters, some special adaptation of means to ends is required; and the arrangements for any given room must be planned by some one who has practical knowledge of the subject. The discovery that the pressure of the atmosphere can thus be utilised as a perpetual source of air supply without the aid of fans or other mechanical contrivances; the discovery that all draughts can be obviated by the employment of vertical entrance channels, provided only that their mouths are not too near the ceiling, and the discovery that improper lowering of temperature is prevented by the circumstance that the rate of entrance of air is governed by the demand, are truly comparable in their simplicity to the balancing of the egg by Columbus. Simple as they are, they are none the less calculated to add greatly to the public health and comfort. Their very simplicity implies a cheapness which places Mr. Tobin's contrivances within the reach of every one.—"Times."

The principle of ventilation by utilising the pressure of the atmosphere (says Captain Galton in a subsequent issue of the "Times") is not new. It has been applied in a number of ways in various public and private buildings; notably in the method of barrack-ventilation adopted in 1857 by the Barrack and Hospital Commission

under Lord Herbert's auspices. Nor is there any novelty in the method of introducing fresh air into a room by means of vertical shafts delivering the air into the room at a few feet from the ground. I used it in 1861 in the wards of the Herbert Hospital at Woolwich, and in other hospitals, but I utilised the fire-place for the purpose, placing it in the centre of the ward, with its flue carried under the floor, in order that in cold weather the fresh air should be tempered by the spare heat from the fire. Plenty of other instances might be cited. The principles of ventilation are well known. It is the application of those principles in special cases which causes the difficulty. The amount of current of inflowing air into a room will depend upon the facilities or arrangements for outflow, and *vice versa*. Therefore, for perfect ventilation, the proportions and position of both outlet and inlet must be considered; neither can be neglected; and if in the room on which Mr. Tobin experimented the air remained pure, it was because there was, in addition to the inflow, some means for an outflow of a sufficient quantity of air to remove impurities. In English rooms of ordinary construction the open fireplace creates the difficulty in the introduction of fresh air. It is the cause of draughts, because the chimney with a fire in the grate is a strong engine for removing the air from a room, and it draws in through every means of ingress air to supply the place of that removed. If this air comes in cold, draughts are felt, whatever be the position or manner in which the air is delivered. The hotter the fire the stronger the current up the chimney, and the greater the draught. For this reason, if a room with an open fire is to be really comfortable it should be provided with a continuous supply of fresh warmed air, and if the inlet be from 6 to 9 feet above the floor the inflow will not be felt by the occupants. The waste heat from the fire affords the most economical method of warming the fresh air. Where the principles of ventilation are carefully attended to, and where the inlets for fresh air and the outlets are duly proportioned to each other and placed in proper positions, and the fresh air adequately warmed and cooled as required, there will be no failure in ventilation. Where failure does occur it is either because of a misapplication of principles, or of a disinclination to incur the necessary expense for carrying the principles into effect.

Dr. Bradenell Carter, in the "Times" of the 17th inst., says:—I venture to think that Captain Galton is entirely mistaken in supposing that either he or anyone else in England has ever before adopted anything like Mr. Tobin's system of ventilation. The essence of that system, as I understand it, depends upon the delivery of air in vertically ascending columns, and in the utilisation of the pressure of the atmosphere for maintaining the vertical ascent of the inflow after it is delivered. In 1869 I had the pleasure of hearing Captain Galton deliver an address on the construction of hospitals before the British Medical Association, and that address, in its published form, is now before me. It enters very fully into the question of hospital ventilation, but it distinctly describes and recommends a horizontal inflow; and the vertical shafts behind the fire-places in the Herbert Hospital are figured as opening on the face of the wall, so as to deliver warmed air horizontally. I am quite sure that so acute an observer as Captain Galton, if he had once, even by accident, witnessed the effect of air delivered vertically, would immediately have recognised the great superiority of this method over all others, and would have urged its adoption wherever his influence could be brought to bear, either by tongue or pen. I must again differ from Captain Galton where he says that "the principles of ventilation are well known." I quite admit that certain principles have been laid down, by none with more force and clearness than by himself, and that these principles have been widely accepted. For the last few weeks, however, I have been in the hourly observation of facts which convince me that these accepted principles are to a great extent erroneous, or, at least, that they are conclusions which have been founded upon insufficient data. When Captain Galton writes that "if this air comes in, cold draughts are felt, whatever be the position or manner in which the air is delivered," he reminds me of the elaborate articles in which the "Edinburgh Review," some fifty years ago, showed the impossibility of railway travelling. The very able writers in that journal proved, beyond the possibility of doubt, that the revolutions of the wheels of an engine intended to be locomotive would not communicate movement to a train; and that if, by any mischance, movement of the train did occur, the passengers would all perish by suffocation from the impossibility of breathing during rapid travelling. When reputed principles will not harmonise with manifest facts, I am more disposed to reconsider the principles than to doubt the evidence of my senses. Into the female ophthalmic ward at St. George's Hospital, which contains nine beds, is warmed by a single fire-place, and lighted by two windows, four vertical tubes have been introduced. Each tube is semi-circular in section, with a radius of $2\frac{1}{2}$ inches, giving a total area of about 40 square

inches. From each tube there ascends a continuous current of air, varying in its rate of flow, but always perceptible. The currents are unbroken as high as a long taper held at arm's length can follow them. They do not spread at all until they reach the ceiling or its vicinity; and if they occasion draughts, the flies on the ceiling are the only sufferers. There is no trace of draught in any part of the ward, which is accessible by ordinary means, and no draughts are felt either by patients sitting round the fire or by those lying in bed, although the heads of some of the latter are within a foot of the openings of the tubes. The door of the ward is kept closed, and the atmosphere within is fresh and untainted at all hours of the day and night. The patients who were in the hospital when the system was introduced were, without exception, delighted with the greatly increased comfort which was afforded them. The rate of inflow of air seems to me to be governed by the demand—*e.g.*, it is perceptibly increased during visiting hours; but the general temperature is not lowered. At my visit to-day the thermometer stood at 65°, and in the male ward, which resembles the other in every respect, except that it is not yet ventilated, the temperature was only 63°. It is not the least advantage of the system that it requires the door to be closed, and each ward to be complete in itself, so that there can be no passage of hospital atmosphere from one to another. For the present, I am content with the state of the female ward; but, in anticipation of summer, I purpose to have a fifth tube inserted, and also to have window openings on Mr. Tobin's principle. At home my experience is of the same kind. There are no draughts in the ventilated rooms, but the air contained in them is always fresh and sweet, and, when gas is lighted, there is no superheating of the air above the burner. I am distinctly conscious of increased comfort and increased power of work from the improved atmosphere in which I live.

Scarcity of Water.—It has been shown, by a deputation who waited upon Mr. Selater-Booth the other day to urge the appointment of a Royal Commission to enquire into the water supply of England and Wales, that the rural water supply is everywhere getting scarcer in consequence of rivers becoming more and more contaminated with the matter thrown off by towns and villages; while, in many parts of England, there is often a scarcity of water amounting almost to a famine, "and it is no uncommon thing for women and children to wait for hours with little vessels to carry away a scanty supply for the domestic purposes of the family."

Use of Mineral Poisons by Cultivators.—Dr. Le Conte recently called the attention of the Philadelphia Academy of Science to the extensive use of Paris or Schweinfürth green for destroying insects injurious to vegetation. Paris green is a mixture of arsenite and acetate of copper, and in the result of certain empirical experiments has been recommended as destructive to the Colorado Potato beetle, and, in fact, as a universal remedy against injurious insects which appear in masses. Now arsenic and copper are poisons which act with equal energy upon plants and animals. The material, though diffused upon the leaves of the plants to be protected, which are incapable of absorbing it, is speedily carried into the soil, and if used annually it is merely a matter of time how many years will elapse before the soil is poisoned so as to prevent the growth of all vegetation. The chemical possibilities which may result in the poisoning of the vegetation raised from the soil I will leave to be developed by my colleagues. I solemnly protest against the loose manner in which, on the recommendation of persons who have observed only the effects of these poisons upon the insect pests to which their attention has been directed, a most dangerous material has been placed in the hands of large numbers of men. The manufacture of this poison has increased to a fearful extent. A friend residing in one of the great agricultural centres of the West writes that the druggists of his town order it by the ton. The ravages of the Colorado Potato beetle, which has been the chief cause of the use of Paris green, commenced in the West many years ago, and its extension at a regular rate was predicted by entomologists. The prediction has been verified almost to a year. An interesting discussion followed the reading of this paper. All the members who took part in it approved Dr. Le Conte's views as to the danger of using Paris green. Prof. Silliman had heard of several instances of loss of human life from carelessness in its use for killing cockroaches. The discussion finally took a wider range, and embraced the rise of aniline dyes for colouring jellies and confectionery. It closed with the adoption of the following resolution, on the motion of Prof. Alexander:—"That a committee be appointed to investigate and report upon the subject of the use of poisons applied to vegetables or otherwise for the destruction of deleterious insects and other animals, and also the incautious use of poisons in the ornamentation of articles of food and for decorative purposes generally, such, for instance, as the colouring of paper."

TREES AND SHRUBS.

THE STONE PINE OF ITALY.

(PINUS PINEA.)

IN the review in *THE GARDEN* (p. 233), of Mr. Gordon's new edition of his admirable work "*The Pinetum*," attention is directed to his description of *Pinus Pinea* as being somewhat vague and disjointed. Few cone-bearing trees enjoy such a world-wide reputation as the Stone Pine of Italy, and the description of it by Mr. Gordon as "a low-growing tree of 15 to 20 feet high" does it but scanty justice. In northern Europe, and especially in England, its general appearance is certainly that of a low-growing tree, its densely-clothed branches forming almost a spherical mass; but, in the sunny south it attains a height of 75 to 100 feet, losing, as it ascends, all its branches, except those towards the summit, which, in maturity, assume a mushroom form; these extend widely and laterally, and when illuminated by the setting sun become, with the smooth, lofty shaft, intensely red, whilst the dense foliage is of a rich olive tone with deep sombre shadow—a combination of colour that produces a magnificent effect. In Rome and its vicinity, those of the Villa Borghese (which are represented in the accompanying engraving), as well as those of the Villa Pamfili-Doria, and the Pine Groves of the Villa Barbarini at Albano, are well remembered; some of these now live only in memory, many hundreds having been ruthlessly destroyed during the more recent wars and sieges. A very wide-spreading but short-stemmed specimen covers the whole area of the well-known Maze, in the Alfieri Villa. The lofty, or normal type, with the umbrella-formed top, is almost peculiar to Central and Southern Italy. In Spain, the south of Europe, and England, though often attaining large dimensions, it remains more dwarf and rotund in shape. The celebrated "*Pineta*"—its chief habitat, skirts the shores of the Adriatic to a distance of 20 miles from the River Lamone, north of Ravenna, to Cervia, on the south, and is from 1 to 3 miles in breadth. No forest is fraught with more poetical and classical interest than the *Pineta*, the glories of which have been especially sung by Dante, Boccaccio, Dryden, and Byron, and it is still known as the "*Vicolo de' Poeti*." The cones of this vast forest supply the "*pignoli*" of commerce, yielding about 2,000 rubbii annually, whilst the empty cones are used extensively as fuel. The Italian cooks use these seeds in their soups and ragouts, and in the Maritzozzi buns of Rome. They are soft and rich, and have a slightly resinous flavour. The *Pinus Pinea* was highly esteemed by the Romans and mediæval Venetians as valuable timber for masts and ship-building. The finest specimen with which I am acquainted in England is in a garden at Clapham Common, and is associated with Cedars of Lebanon, Acacias, and other noble trees.

E. W. C.

Glen Andred, Sussex.

DIFFERENT KINDS OF IVY.

No evergreen that we possess equals the Ivy in adapting itself to local surroundings, and it is remarkable that so useful a plant has never yet occupied that place in ornamental gardening which it well deserves to hold. Lately it has been brought rather prominently into notice as a plant for ornamental screens, but this is only one out of many uses to which it is adapted, both in the open air and under glass, as well as on the cottage window-sill, where it will grow, and may be formed into any shape—an object of beauty, where few plants of any other description would thrive. Of course, when I speak of Ivy growing indoors, I refer to the small-leaved varieties, whose habit of growth and formation of leaves give them a superiority over the large-foliaged kinds. One of the prettiest and most compact among the small sorts is the Palmate-leaved Ivy, the leaves of which in many places assume in autumn and winter lovely bronze and golden tints. This is the best variety for covering dead walls in villa gardens, as it scarcely ever requires thinning. Ivy, too, makes a charming evergreen fence when trained on any description of iron rails, which, when well covered, have a light and pleasing appearance, especially in winter. Niches or rustic recesses in Ivy-covered



STONE PINE TREES IN THE GARDENS OF THE VILLA BORGHESE.

walls form excellent places for vases or other kinds of flower-stands; and, if the vases or stands are set on pivots, in such a way that they could be turned round at any time in order to expose all sides to the sunlight, bulbs and other spring flowers would succeed well in them. Recesses of this description are also well adapted for statuary. At the end of a broad terrace that skirts the base of the Pentland Hills there is an Ivy-covered grotto, on each side of the entrance to which is a niche, in which stands rude stone statues of Robert the Bruce and Earl Douglas, and with no other surroundings would they have been set off to such advantage. In rustic gardening Ivy is indispensable; it can be made to assume any shape, provided attention and care are bestowed on it, so as to keep it within proper bounds. The question as to whether it creates damp or not in the walls of dwelling-houses seems to be yet undecided. The late Mr. Loudon was of opinion that it kept them dry; it, however, affords a harbour for spiders and other insects that find their way into the houses; and I may add that rats sometimes find it very convenient when they want to enter an open window. My own observations seem to prove that when a dwelling-house stands in a low situation Ivy is not a desirable plant to have upon its walls, but that when a residence stands high, and is exposed freely to the blast, it forms an excellent protection against damp. A shooting lodge, with which I am acquainted, was built of stone so porous that it sucked up moisture like a sponge; but since its walls have been covered with Ivy they are comparatively dry. Where Ivy has been established upon walls for years its rootlets become so thickly matted that rain can hardly penetrate them. Every lover of woodland scenery must agree that trees festooned with Ivy are improved in appearance. We have a variety of it here, the leaves of which are diamond-shaped, and of a beautiful bright green. It does not run upon the ground, but ascends trees, and it appears to prefer dwarf ones to such as have any great height, and so dense and thick does it grow that a Hawthorn covered with it looks at a little distance off like a fine standard Portugal Laurel. This I consider the best sort with which to cover decayed trees or stumps, for, when once established, its stems become self-supporting; and, as its leaves seem to grow brighter as winter advances, it forms a very suitable plant for the shrubbery or wild garden. The variety alluded to by "Salmoniceps" (see p. 311), though a fine kind, does not adhere to wood or stone so tenaciously as other sorts. All things considered, the palmate-leaved sort is the best I have ever met with. The leaves vary in colour, from a pale green to a beautiful bronzy hue, and, as I have already said, it requires little or no training, adhering, as it does, to walls most tenaciously. But its proper and natural place is upon the grey tower or mouldering ruin, on which it shows its beautifully tinted leaves to good advantage.

J. T.

MORE NEW PLANTS FROM JAPAN.

MR. S. B. PARSONS alludes, in the "American Garden," to the following recent introductions from Japan. A new weeping *Retinospora*, about 2½ feet high, with branches not simply drooping, but regularly weeping—in as pronounced a style as the common Weeping or the Kilmarnock Willow; its evergreen branches curved over from the top and, reaching the ground, rested upon it. With the exception of the Weeping Hemlock, there is no evergreen so pronounced in its character. A very fine *Magnolia*, which has since bloomed, proves to be of the *purpurea* family, with flowers darker and richer than *gracilis*. Another *Magnolia* is apparently dwarf, with round leaves, ferruginous on the under side. A new *Cornus*, with broad golden variegated leaves, proves very rare and beautiful. The *Daphne* *Gwenka* is already in bloom (March 10th) with blue-lilac flowers. Its earliness and hardiness will make it a great acquisition. There were 150 plants of those beautiful Japanese Maples, some of which have leaves cut like the finest lace, with colours of the richest pink, scarlet, and purple. There were some specimens of a new *Spiræa*-like plant, which are now showing leaves, and which Mr. Hogg thus describes:—"It bears immense quantities of fragrant white flowers in a sort of panicle, and somewhat resembles a *Spiræa* in general appearance. It will prove a fine addition to our hardy shrubs, from the fragrance of its flowers. There are, also, a new *Photinia*; some plants of a very curious cut-leaved Oak; the *Trochodendron aralioides variegatum*; a variegated variety of the *Planera*

Kaki; five species of *Rhus*; three new evergreen broad-leaved Laurels; the *Pinus Massoniana variegata*, very distinct and beautiful in its markings; a number of new Tree Peonies; a species of *Schizophragma*; a hardy twining *Hydrangea*, from the Japanese mountains; two new varieties of the very beautiful plant with drooping racemes of yellow flowers, known as *Hamamelis japonica*; another genus related to it, known as *Corylopsis*; two varieties of *Stuartia japonica*; a new variegated leaf *Corchorus*; two varieties of variegated *Deutzia*; three other new varieties of *Deutzia*; a new *Magnolia* with fragrant white flowers; the *Magnolia compressa*, a Japanese species resembling *M. fuscata*, only of much stronger growth; three varieties of *Raphiolepis*; a variegated leaf *Eriobotrya japonica*; a variegated *Ilex tarajo*; a variety of *Eurya*; a new Willow; a new *Pyrus*; two new *Pinus*; two new *Viburnums*; a number of sorts of dwarf *Cryptomeria*; a new *Skimmia japonica*; a variegated-leaved *Pyrus japonica*; a weeping *Cerasus*; three new Oaks and two new *Arbor-vitæ*, besides the *Cercidophyllum*, a charming shrub which we have growing freely from a previous importation.

The Redwood Supply.—Recent estimates of a quantity of timber in California show that, with due care in planting young wood, it is practically inexhaustible. In Sonoma County alone it is estimated that there are 1,000,000,000 feet of Redwood, if it were all sawn into boards. The present annual exportation amounts to 20,000,000 feet, so that there is enough to last fifty years, even if there were no new growth obtained. Considerable tracts will average 900,000 feet to the acre, and a single tree has been known to produce 50,000 feet. Humboldt is still richer. The following table shows the number of acres of Redwood, the average feet of hard timber per acre, and the aggregate feet in each district:

Districts.	Acres.	Average.	Aggregate.
Eel River Basin . . .	100,000	800,000	80,000,000,000
Van Dusen Basin . . .	15,000	600,000	9,000,000,000
Salmon Basin . . .	20,000	800,000	16,000,000,000
Elk Basin . . .	35,000	600,000	21,000,000,000
Madand Century . . .	150,000	900,000	135,000,000,000
Little River, &c. . .	250,000	100,000	25,000,000,000
Eureka, &c. . .	105,000	200,000	21,000,000,000
Total	675,000		307,000,000,000

The mills of the county now cut about 40,000,000 annually, at which rate they would exhaust the supply in 7,675 years. Sonoma and Humboldt together have not a quarter of the fine timber trees of the state, and not more than 1 per cent. of the stock on the coast west of the summit of the Sierra Nevada and Cascade Range.

The Olive in Portugal.—The Olive plays no inconsiderable part in the ordinary food of the people of Portugal; and the experience of ages has shown it to be both grateful to the palate and wholesome. The common practice is to allow the larger and more fleshy kinds to become ripe—i. e., black—when they lose a good deal of their astringent and acrid taste. These are then scalded in water considerably under boiling, into which an ounce or so of soda to the gallon is dissolved, and allowed to stand in it for three or four hours—in fact, till it is cold. They are then taken out, and well washed in cold water several times over, and finally put into a clean wooden or large earthenware vessel, and completely covered with a pretty strong brine of salt and water, and covered up from the air. Another lot, first treated as above, is put down as a pickle in moderately strong vinegar, and used as required.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

New Variegated Maple.—A very neat form of the well-known Silver-leaved Maple has been introduced to notice by Ellwanger & Barry, of the Mount Hope Nurseries, Rochester, N. Y., which promises to be a valuable acquisition. It is called Weir's Cut-leaved Maple, and is remarkable for its deeply lacinated foliage. I read the above in an American paper. Will any of the readers of THE GARDEN tell me if the plant is in cultivation.—T. S.

Rhododendron Falconeri.—A plant of this fine variety is at present in flower here, showing five trusses of its large, round, creamy-coloured flowers. The plant must be nearly twenty years old, and never bloomed until last year, when only one truss flowered. I had seeds of this variety, and the following kinds of Bhotan and Sikkim *Rhododendrons* from the late Mr. Hugh Low, of the Clapton Nursery:—*Argenteum* *Campbelli*, *Campylocarpum*, *Jenkinsii*, *Dalhousianum*, *Aucklandii*, and a small flowering kind with tubular red flowers. This was in 1854, and they have all flowered now, *argenteum*, *Campbelli*, and *Falconeri* being the shyest in flowering. With age they make fine plants for a large greenhouse or cool conservatory, and if planted out in the borders, together with arborea, they would be the handsomest greenhouse flowering trees in cultivation.—WILLIAM TILLERY, *Welbeck*.

The Fever Gum Tree in California.—General Nagle of San José is said to have "the finest avenue of *Eucalyptus* in California." The lines are more than 1,000 feet long; the trees, planted six or seven years ago, are 60 to 70 feet high, and their trunks "large at the base as barrels of flour."

GARDENING FOR THE WEEK.

Hardy Fruit.

FRUIT prospects this year are, on the whole, most cheering. Apricots have set an abundant crop, Peaches are one mass of pink blossom, Pears on south and west walls are sheets of white bloom, and Cherries and Plums are the same; but we are not yet out of the wood, so to speak, as one night's frost, such as we sometimes get at this season, might ruin our hopes. Therefore, the anxiety felt for the safety of the crop should awaken us to action in devising ways and means to protect the blossoms on the first indications of frost; for, though the season is backward and so far favourable, still, it will not do to trust too much to our fickle climate. Where proper coverings for walls exist these are generally let down at night and drawn up in the morning, but in the event of sharp frosts they should remain down for some time after the sun is up; and if very bright they are better down altogether, as more harm is sometimes caused by the fierce rays of the sun than even frost itself. The great show of bloom on many trees this season will make it absolutely necessary to thin some of it. At this busy season but little time is at command for such work, but an effort should be made to go over some of the choicer kinds of Peaches and Pears, and take off the weakest blossoms from some of the largest spurs; those left will set all the better and furnish finer fruit than would otherwise be the case. Apricots often set their fruit in clusters, and these should now be thinned out, taking off the smallest and badly-placed, and pinching back the new growths to two joints. Peaches and Nectarines should also now be disbudded, an operation frequently recommended to be done by degrees, *i.e.*, by going over the trees several times, and taking a few shoots off each time at intervals of a few days. Where the trees are left too long before disbudding takes place, I can understand such a proceeding being necessary to prevent a check being given to the trees, but experience teaches me that if done early it may be done finally. As soon as the fruit is set it will be advisable to thoroughly syringe or wash the trees with the garden engine, in order to cleanse them from fallen blossoms, and, if aphides appear, dust with Pooley's tobacco-powder or syringe with tobacco-water; of the two remedies, the former is the most effectual and easiest of application. Currant bushes are frequently, even before the foliage has fully expanded, attacked with the blue aphides, for the destruction of which I have found nothing better than frequent washings with clear water. Gooseberries infested with the caterpillar can only be effectually cleansed of it by means of hand picking the moment it is perceived. Grafting will have been completed ere this, but it will still be desirable to look over all trees thus operated on, in order to see that the clay is not cracked by drought, or washed off by rain. As soon as the grafts have taken, rub off any shoots produced by the stock. Should the weather continue dry, late-planted trees will require watering; after which, if not previously done, cover the roots with half-rotted manure, and see that all are securely staked and tied, to prevent wind-waving. New roots are destroyed as soon as they are produced where rocking to and fro is permitted to take place to any great extent. Well trench and manure a piece of ground for the Strawberry plants now being forced, which, as soon as hardened off, should be planted out. From these a crop of fruit may be gathered in autumn. The best kind for this purpose is Vicomtesse Héricant de Thury. From this kind, planted in the end of April last year, I gathered many dishes of finely-flavoured fruit all through the month of October; and the only attention they had after being planted was an occasional watering, the flowers also being sometimes picked off till the plants had fairly started into growth.—W. WILDSMITH, *Heckfield*.

Indoor Fruit Department.

Vines.—All young Vines should now be growing freely, and those rooted in small pots must be shifted into larger ones before their roots become coiled and matted, for when this is the case the roots do not penetrate the fresh soil so quickly and freely as is desirable. The time to re-pot should depend more on the quantity of the roots than the size of top growth, as a large number of roots is produced from shoots not over 12 inches in length, and Vines of this description are often as fit for shifting as others with a growth three times longer. All kinds should be shifted into their fruiting pots. Many pots are still used that are considerably over a foot wide for growing fruiting canes, but a great deal of labour may be saved and the same results obtained by never exceeding this measurement. Those intended for planting canes should be put into 6 and 8-inch pots; for, although as good canes may be obtained in a 4-inch pot as either of these sizes, the roots in that case are not in such good order for planting out at the end of the season. After potting, the ball should be moistened with a fine rose watering-pot, and they should be subjected to a temperature of 65° at night and to 10° or 15° more

during the day for a few weeks. Shading during strong sunshine prevents the leaves from flagging, and is not trying to them until fresh roots enables their full exposure. A moist atmosphere is also beneficial to them. Those propagated in boxes, or beds of soil and turf, should be ready for root pruning by this time, and a large, sharp knife should be run between each row, going to the bottom at each cut, so as to divide the roots; water as soon as this operation is performed, and keep a little close for a few days. A week hence cut in the same manner the other way, when each Vine will be left with a square of soil for itself. So soon as the small rootlets have begun to show at the part where they have been cut they should be carefully lifted and potted in the same way, and be treated in a similar manner to those raised in pots. Widen the space between those growing on turves, for the roots of one should never be permitted to enter the square of another. Any strong roots which appear at the edge of the turf should be pinched back, when a quantity of small roots will be formed, which are of far more service than a few long ones.

Pines.—A temperature of 65° is now a suitable heat for the generality of Pines at night. Unless where the fruit is wanted immediately, much finer specimens will be produced in this temperature than in one 10° higher. Air must be given earlier in the morning than hitherto. Admit it gradually after the thermometer indicates 75°, and increase it, as required, until 85° is reached by sun heat. It is a bad plan to run up to this degree before giving air, and suddenly, by opening the ventilators, to reduce it. Close before the influence of the sun is off the houses; and the temperature at this time may be allowed to rise to 90°. On mornings which give promise of a good day, damp the fires by putting in the dampers; close the ashpit doors, put wet ashes on the fire, and start again in the evening in time to keep up the above night temperature until the following morning.—J. MUIR.

Flower Garden and Pleasure Ground.

Continue gradually to harden off bedding plants of all sorts by transferring them from the close warm atmosphere of the propagation house to cold pits and frames, and afterwards to sheltered situations in the open air, where they can have the protection of mats, or other materials, when danger from frost is apprehended. Annuals which may have been sown some weeks since in heat, will now be fit to prick out into pans, boxes, or frames. Keep them for some time somewhat close, until they become again established, when they may become gradually hardened to full exposure to the open air, when advantage should be taken of the first opportunity after a good fall of rain to plant them out where they are intended to flower. Seeds may also be sown now, upon a shady border in the open air, of such plants as the Sweet William, Wallflowers, Anemones, Pansies, Polyanthuses, and Alpine Auriculas; or such seeds may be sown in pans or pots, under glass, and planted out when large enough to be handled. Keep beds of Carnations, Ranunculuses, or Tulips, free from weeds and decaying leaves, and carefully support the flower-stems, &c., by stakes, whenever this may be found necessary. Patches, or beds, of the various kinds of Violets should now be broken up, and strong well-rooted runners should be selected; these should be pricked out into light sandy soil on a shaded border, and should be well supplied with water until they are fairly established. It is always advisable to form fresh beds of these plants every year, as young plants are always found to bloom more profusely than old ones, and they also furnish much finer flowers. Amongst the finest of these sweetly-scented flowers is the Neapolitan variety, although it seldom succeeds well in the open air in this country, but requires the assistance and protection of a frame; where, to induce it to produce blooms early in the spring, it should be planted near the glass, and the temperature of the frame should be slightly increased by means of fermenting materials placed around it. The double and single Russian kinds are also very useful and quite hardy, as are also the varieties known as the King and the Queen of Violets. The former is a fine, large, double, dark blue sort, and the latter, with flowers equally large and double, is in colour nearly pure white; while the Czar is a fine, hardy, robust sort, producing a profusion of single blooms at an earlier period than any of the other sorts, and is, perhaps, slightly less sweet-scented than some of them. There are, also, in addition to the sorts already mentioned, several other valuable varieties, including some novelties, which are highly recommended. The present is also a suitable time to cut and regulate the margins or Grass verges of walks and clumps, &c. This operation should be carefully performed with the edging iron, with the assistance of garden line and pegs, and this should be done every season, or at least once during every two years, although a deep raw edging to a walk is exceedingly objectionable, yet the level of the marginal turf should be somewhat higher than the level of the gravel at the sides of the walk, so as to admit of the Grass shears being applied, and these should be used on every occasion when the Grass is mowed, so as to

distinctly define the margins, and to prevent the Grass from growing into the gravel. There is nothing that renders gardens and grounds more enjoyable, than thoroughly good gravel walks, while, on the other hand, being compelled to walk upon rough, loose, or unset gravel, is anything but pleasant. Even the colour of the gravel forming the walks has much to do in giving character to the aspect of the surroundings of the mansion or residence, or in the production of a cheerful and pleasing effect or otherwise. It is also of the greatest importance that walks should be rendered as dry as possible by thorough drainage. They also ought to be smooth, hard, and solid; river gravel is consequently seldom well adapted to the purpose of walk making, being generally deficient in binding properties. Perhaps the best gravel is to be obtained from pits, which usually contains an admixture of loam, that gives to it the necessary consistency. But, of whatever nature the gravel may be, in order to render walks firm and solid, it is always necessary to roll them well when in a moderately wet condition, and this operation ought to be frequently repeated, in order to keep them in good condition. About this time it is also sometimes found advisable to destroy weeds and Moss by the application of a good dressing of salt, which gives also a clean appearance to the gravel. There is, however, one condition necessary to the success of the operation—that is, a few bright sunshiny days to follow, for, if rain should fall very closely upon the application of the salt, little advantage will be derived from it. It is also necessary to take great care that the salt does not come within a distance of at least 6 inches of Box, Grass, or other edgings, otherwise they will be destroyed.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Roses.

Allow me to inform Mr. Fish, in reply to his remarks (p. 319) that flowers of *Auguste Mié* and of *Coupe d'Hébé*, placed in a stand, have been shown by me to good judges, and have been taken for one and the same variety. *Auguste Mié* resembles *Coupe d'Hébé* not only in colour, but also in wood and foliage. *Madame Rivale* is a much lighter Rose, but in shape, and even in the character of the wood, is like *Auguste Mié*; and there is no doubt that *Madame Rivale* is often sent out as that variety. These Roses excel in shape many of the older varieties. Roses vary according to soil and treatment. Blooms for show purposes require to be large, full, and good in form—points that are all taken into account by good judges of Roses. As regards new Roses, scent should be made a matter of more importance than hitherto. A great many new varieties are almost destitute of fragrance, a property possessed in such a marked degree by the old Cabbage and common Roses. Our new Roses have beautiful shapes and colours but, as regards scent, little can be said in their favour. Such kinds as *Baronne Prevost* and *Géant des Batailles*, when fully open, are incomparable, as respects form, with such finely-shaped Roses as *Paul Neron*, *Countess of Oxford*, *Victor Verdier*, *Pierre Notting*, *Xavier Olibo*, and others of that class; therefore, when we plant Roses for show purposes, form is the chief point to keep in view; but many of our best show varieties are also equally good for garden decoration; but, in the latter case, we ought also to have fragrance. All, therefore, who intend purchasing new varieties for planting next autumn, will do well to visit our great Rose nurseries during the summer, and make a note of such kinds as possess the best qualities in the most marked degree. Fine foliage, such as that belonging to *Victor Verdier*, *Centifolia rosea*, *Boule de Neige*, *President Thiers*, *Beauty of Waltham*, and many others should also be secured. Pot Roses will now be in perfection, and it is well to select from among the varieties shown such as are of good habit and colour.—H. G.

Kitchen Garden.

There is yet time, if desirable, to make new plantations of Globe Artichokes for autumn bearing. Our usual way is to take up a row, divide the roots, and plant elsewhere, using good large pieces in preference to offsets, as the latter rarely produce much the first season. Four feet apart each way is a good distance, or, where ground is scarce, 3 feet from plant to plant may do. Early blanched Celery is often in demand for stewing, flavouring, &c., before it can be obtained in the usual way in the open ground, and, where the necessary facilities exist, it may be forced easily. Open a trench, the width of any available frame, 2 feet deep, and near the water supply. When this has been trodden down, fill in to a depth of 15 or 18 inches with any material that will furnish a mild bottom-heat for a few weeks, so as to give the plants a start. Spent hotbeds turned over and watered will usually do this, or, if necessary, a small proportion of the short Grass from the pleasure ground may be well mixed with it. This, however, must be used sparingly, as it throws off a violent heat. Spread over this a layer of rotten dung, and place on the surface 4 inches of rich soil. Plant out in rows, 8 inches apart, and 6 inches from each other in the rows, the best and strongest plants obtainable.

Success will, in a great measure, depend upon the plants having been grown unchecked from the seed. Very early sown Celery, unless carefully managed, often proves a failure. Mushroom-beds should now be made in the open air, or in some open north shed, as in a Mushroom-house of the ordinary kind, it is, in hot weather, next to impossible to obtain them free from maggots. There will be no difficulty in keeping up the requisite temperature in the open air beds from this time, but the litter should sometimes be turned over and shaken up; for, if the layer next the bed gets damp, the spawn, when working, will sometimes run into the litter, and thus partially exhaust itself. Where it has not yet been accomplished, this is a good season for re-arranging the herb beds. Sage, Rosemary, Rue, Hyssop, Lavender, &c., usually raised from slips or cuttings, will strike better now than at any other time. Most of those I have named may also be raised from seeds sown now. The common Thyme should also be sown now, and new beds made from the seedlings sown last year. Lemon Thyme, Pennyroyal, Balm, and Chamomile, should be divided and re-planted annually; the latter especially is apt to degenerate if grown long on one plot of ground. I have already referred to Mint and Tarragon in former Calendars. See that a liberal supply of Parsley is provided, and any sown in boxes may soon be pricked out. Transplanting has a tendency, by increasing the curliness of this plant's foliage, to make it more ornamental in appearance. As soon as possible the hoe should be employed amongst Onions and other crops now coming up. Stirring the soil frequently helps the growth amazingly, besides keeping down weeds. North borders will soon become useful for sowing Radishes, planting Lettuces, Cauliflowers, &c. Where it can be done, the old Mushroom-beds should be saved for mulching salading by and bye; broken up fine with a fork, and placed amongst Radishes and Lettuces, it not only saves a vast amount of labour in watering, but adds to the quality of the produce. Rampion may be sown on finely pulverised ground. If sown in drills they must be very shallow, as the seeds are very fine. I generally grow it on 4 feet beds; rake the surface finely, sow the seeds thinly, cover with a very shallow layer of fine sifted soil, flatten it down with the back of the spade, and finally thin out to 6 inches apart. The flowers of this plant are exceedingly pretty, and it would make a very handsome border biennial.—E. HOBDAY.

SETTING BOILERS ABOVE THE PIPES.

So far as this discussion has gone, the weight of evidence seems in favour of retaining the deep stokehole, or, at least, placing the boiler well under its work. With facts pointing to a different conclusion, however, daily before my eyes, I find it difficult to acquiesce in the verdict. During the last twenty-five years, I have worked a good many different forms of boilers set more or less deeply in the ground; but I have never been better satisfied than I am now with our present arrangement. It will probably be in the recollection of many of your readers that a good many years ago, what is now termed the "one-boiler system" was in its infancy. It was a common plan in attaching two or three houses to one boiler to take the flow from the boiler to a small iron cistern or tank, in which all the valves were placed. This cistern, or valve-box, was placed above the boiler, and was, in fact, the highest point the water reached, and from which it was distributed in a gradual descent—varied, of course, according to the exigencies of each case—till the boiler was again reached. I worked two apparatuses on this principle twelve years; and for rapid circulation and perfect control over them, I have never met with anything superior to them since. Doubtless, the more simply the pipes are arranged, the less friction there will be, and, consequently, less waste of power; but when half a turn of a valve will send the water rapidly in any required direction, there cannot, I think, be much loss of force. I have always been in the habit of bestowing upon the stokehole, and its belongings, as much attention as upon any matter that comes under my care; and I know of nothing that pays better for personal supervision. I cannot understand how anyone can call a good example of a vertical tubular boiler a wasteful one. If properly set and well managed, I consider it at least equal to any other form, both for economy and efficiency. I well remember the severe winter of 1860-61. How earnestly I wished the four boilers then under my charge had all been vertical tubular. There are, however, two things essential to economy in any boiler, but more especially so in the case of a vertical tubular, viz.,—plenty of boiler power, in proportion to the work to be done, and intelligent stoking. The main secret of economical management lies in keeping the boiler clean, and in the proper regulation of the ashpit door, and the damper in the chimney. Steady, but comparatively slow combustion, is the right principle to adopt if we wish to derive the maximum amount of heat from the fuel and usefully employ it; and, to

the neglect of this, I attribute the various complaints we sometimes hear of vertical tubular boilers being wasteful. With reference to making a stokehole watertight, I imagine, from the easy way in which some of your correspondents speak of the matter, that they hardly appreciate the difficulties that have, in some places, to be encountered; to make a stokehole, 6 or 8 feet deep, watertight is in this district a very costly affair. Some time ago a gentleman, who had built a greenhouse in the Fens, adopted the expedient of placing his boiler in an iron tank to escape the annoyance of water breaking in, although the stokehole was comparatively shallow; had it been clear to him, then, that the water would have circulated with the boiler placed on the surface that heavy expense might have been avoided. In making a stokehole watertight with cement, it should always be borne in mind that a large heavy boiler, with its mass of supporting brickwork, presses heavily on the foundation; and in all the cases of failure I have examined, I have found the water trickling down from some inaccessible spot at the back of the boiler; the conclusion, therefore, to which I have come is, that it was caused either by a slight settlement when the boiler was placed in position, or by expansion from the fire.

E. HOBDAV.

The following facts, which are the result of long practical experience in heating by means of hot water, may not be unacceptable to your readers, especially as we venture to think they may not be without effect in reconciling, or partially explaining, the conflicting views lately put forward concerning this mode of warming by some of your correspondents. An early form of our upright tubular boiler was erected by us about the year 1859, for the late Mrs. Foster, at The Holme, Regent's Park, and was in constant operation, and performed its functions with efficiency, until replaced in the early part of last year by one of our duplex ones. The top of the boiler removed, as well as of that recently put in, stands about 4 feet 9 inches above the pipes. Here, then, is an instance in which the principle under discussion, after a trial of fifteen years, must be admitted to have proved successful. Encouraged by the satisfactory results of our first efforts, confirmed as they were by previous experiments, we confidently adopted the principle, and recommended its application wherever circumstances were such as to render it advisable. From that time to the present the "dip" principle has been constantly employed by us, and upon a scale so extensive that fully one-fifth of the apparatuses constructed by us, are upon that system. Among some of the later examples of its application are the boilers of Messrs. Wood & Ingram at Huntingdon, and at Ramsay Abbey; but we can refer to others still more recent, in which the apparatus has ranged in size from the largest to the smallest, and in which the test is much more rigorous. We have recently, for instance, fitted up a very small apparatus at Swanage, in which the bottom of the boiler is nearly level with the pipes; and this has proved perfectly successful, as it can be worked at no extra cost of fuel, and the heat admits of adjustment to the greatest nicety. At Bradford, again, there is an apparatus which we believe to be one of the largest, if not the largest, in the country, and which has just been erected by us. The building in which it is placed is a factory, with half the roof of glass, standing upon an area of 1½ acre. The quantity of piping employed is about 1½ mile, and during the severe winter through which we have just passed the temperature was maintained at 56°. The top of the boiler, which is unusually large, is at least 7 feet above the pipes, but the circulation nevertheless, throughout the entire apparatus, is uniform. Thus far we have adverted to the bright side of the picture; but it has also a dark one, in the shape of the numerous failures which have certainly attended the attempts to put this system of heating in operation. These failures, however, ought not to be received as facts discrediting the principle. In a word, the arrangement of an apparatus suited to the sunken boiler principle, is not equally applicable to the dip principle. With regard to cost, we may add that this system can be worked, in the form of small apparatuses, at no extra cost of fuel; and in that of large ones the extra cost is too small to be appreciable. In some cases, indeed, there is a positive saving. Allow us to observe, in conclusion, that so far from this system degenerating it has assumed a considerable development; for, instead of being restricted to a dip in the flow, we are now enabled, as the result of some experiments which we made so far back as 26th March, 1874, to heat 2,000 feet of 4-inch piping, by water super-heated in one of our upright tubular boilers, the flow of which came off at the bottom, instead of the top. Here, then, is what we venture to deem a really practical step towards the long-talked-of abolition of stokeholes. J. WEEKS & Co.

Double Cinerarias.—I know a nurseryman, who took great interest in these plants, and who tried to perpetuate his finest double kinds from cuttings. He now, however, finds most of them to be single and worthless.—W.

SOCIETIES AND EXHIBITIONS.

ROYAL HORTICULTURAL SOCIETY.

APRIL 21st.

At this exhibition Messrs. Veitch & Sons showed a select and well-arranged group of new and rare Orchids and foliage plants, as did also Messrs. B. S. Williams and Mr. W. Bull. Mr. J. Walker, of Thame, Oxon, staged three splendid stands of *Maréchal Niel* Rose, which, for freshness and soft beauty of colouring, we have never seen surpassed this season. Messrs. H. Lane & Sons furnished a well-flowered group of Hardy *Rhododendrons*; and Mr. R. Parker, of Tooting, and Mr. Dean, of Ealing, had good collections of hardy spring flowers.

Orchids.—Amongst those shown by Messrs. Veitch were good plants of *Phalænopsis Luddemanniana amethystina* and of *P. Luddemanniana ochracea*; also, a fine specimen of *Saccolabium ampullaceum*, bearing nine good spikes, a perfect rosy-flowered little gem, growing on the summit of an open teak wood cylinder, as shown in the accompanying illustration, sketched when the plant was exhibited last year. From the same firm also came a plant of *Cypripedium Sedenii*, one of the brightest and most free-flowering of *Lady's-slippers*; a plant of the distinct and beautiful *Oncidium concolor*, bearing a gracefully arched spike of ten flowers; three or four plants of the ever welcome *Odontoglossum gloriosum*, *O. Andersonianum*, *O. Pescatorei*, *O. triumphans*, and a new and distinct species named *O. prænitens*, the last bearing two spikes, on which there were nine flowers. The sepals and petals are 1½ inches in length, of a clear yellowish-green tint, blotched with deep shiny brown. The wedge-shaped lip is of the same colour, and the colouring and crest of the purest



Saccolabium ampullaceum.

white. A fine specimen of *Cœlogyne cristata* came from the gardens at Trentham; it was growing in a basket, and was fully a yard in diameter, bearing over sixty spikes of snowy flowers, of which many of the spikes bore seven each. In the class of six Orchids, Mr. B. S. Williams staged good plants of *Camarotis purpurea*, a well-known Orchid, well worth a place in every humid plant stove; *Odontoglossum Phalænopsis*, with four large and richly-coloured flowers; *Masdevallia Lindenii*, with eleven flowers of the richest silvery-lilac; a fine specimen of *Cypripedium villosum*, bearing fourteen or fifteen rich brown shiny flowers; a vigorous plant of *Odontoglossum luteo-purpureum*, with two stout spikes, bearing respectively twelve and thirteen flowers; a small plant of the snowy white-flowered variety of *Odontoglossum Roetzlii*; and a vigorous specimen of the purple-lipped *Warscewiczella discolor*. Mr. W. Bull exhibited an *Anguloa*, named *Turnerii*, bearing four blush-white flowers, the petals of which were delicately mottled with rose inside, the lower sepals, being connivent and cupped at the base. In general appearance, this plant bore a marked resemblance to *A. uniflora* of some gardens. Mr. T. W. Bond, gardener to G. A. Smith, Esq., The Beeches, Weybridge, sent a well-bloomed small plant of *Oncidium altissimum*, and a fine specimen of *O. pictum*, the flower-spikes of which were trained on a large globe-shaped trellis.

Rhododendrons.—In Messrs. Lane's collection of these, the only one exhibited, we noticed, amongst others—*Nero*, a well-known kind, with rich purplish dark-spotted flowers, borne in dense clusters; *Limbatus*, a crimson-edged variety, shading to nearly white in the centre; *Blandzanum*, still one of the brightest of crimsons; *Queen of the West*, lilac-purple, with white anthers, and bright bronze-green foliage; *Fastuosum*, still one of the best double-flowered sorts; *Impératrice*, a variety with glowing-crimson flowers; and *Auguste Van Geert*, with large pale-crimson flowers, borne in immense trusses.

Roses.—Mr. H. Bennett, of Stapleford, furnished a dozen fresh little grafted plants of Captain Christy, a Hybrid Perpetual, with fine full flowers of a delicate rose colour, and of good substance. Mr. Bennett also staged two fine stands of a new Hybrid Seedling, *Duchess of Edinburgh*, a fine full, delicate rosy flower belonging to the *La France* group, and deliciously fragrant. Mr. J. Walker, nurseryman, Thame, sent three splendid stands of *Maréchal Niel*, each stand containing thirty-six large and perfect flowers of this fine yellow Rose. A stand of *Mlle. Marie Conitét*, furnished by Mr. H. Bennett, was much admired. Its smooth petals are of a delicate soft rose, rather densely imbricated, which gives a compact and substantial appearance to the flower. Mr. W. Paul, Waltham Cross, showed two new Roses in pots—viz., *Villaret de Joyeuse*, a Hybrid Perpetual kind, with full globular rosy-crimson flowers; and *Amelie Hoste*, a nearly spineless Hybrid Perpetual Rose, which bears full globular flowers of a delicate rosy-lilac or flesh tint.

Hardy Spring Flowers.—Of these, Mr. Parker exhibited a fine collection, in which were the white-flowered *Ranunculus amplexicaulis*,

with glaucous leaves, and a habit exactly like that of the silvery everlasting *Rhodanthe Manglesii*; *Dielytra spectabilis*, a yard high, and nearly an inch in diameter, profusely covered with flowers, and a small plant of its white-flowered variety. There were also fine pots of *Muscari racemosum pallidum*, a delicate blue Grape Hyacinth; *Triteleia uniflora*, and its bluish-lilac variety, and *Orobis cyaneus*, with bluish-purple Pea-shaped flowers. Of *Primulas*, the collection contained pots of the orange-flowered Golden Plover, and the rich velvety-crimson yellow-eyed kind called Early Admirable; also examples of the golden-yellow *Doronicum austriacum*, and *D. cordifolium*, the delicate cerulean blue *Scilla italica*, and the thick-leaved rosy-flowered *Saxifraga media*. Mr. R. Dean, of Ealing, had also a beautiful collection of spring flowers, including fine pots of white, crimson, and golden variegated Daisies, the lovely blue *Myosotis dissitiflora*, *Lithospermum prostratum*, with rich blue white-eyed flowers; lilac, white, and rosy-crimson forms of *Primula cortusoides*, *Viola Royal Blue*, the deep lilac-flowered *Aubrietia purpurea*, and *Iris nudicaulis*, are of the earliest and best of the purple-flowered bearded section. The same exhibitor had also a choice collection of double and single-flowered *Primulas* and *Polyanthuses*; among the double forms were crimsons, whites, lilacs, yellows, and maroons, and the collection also contained the white bedding *Polyanthus* named The Bride, and the Primrose-coloured kind called Viceroy. Alpine Auriculas came from Messrs. Dobson & Sons, Woodlands Nursery, Isleworth. A collection of the beautiful old-fashioned gold-laced *Polyanthus* came from Mr. E. Eckford, Coleshill House, Highworth. An interesting collection of *Narcissi* came from Mr. P. Barr, of Tooting. Among the finest of the varieties were Empress, a kind with white segments and a golden-yellow cup; Emperor, with sulphur perianth and golden cup; and several effective double-flowered forms of *N. incomparabilis*. Among the smaller varieties were *N. juncifolius*, *N. gracilis* var. *tenuior*, and *N. Mackaii*, *N. bicolor*, and the creamy-white *N. moschatus*, all distinct and effective, as is also the great golden *Daffodil N. maximus*.

Miscellaneous Plants.—Mr. Bull exhibited a small group of new and rare plants, among which were vigorous specimens of the vase-shaped, mottled-leaved *Tillandsia musiacae*, one of which bore a small spike of rich orange flowers, and *Dracena elegantissima*, a kind, graceful in habit, and having the bronzy-purplish-green slender recurved foliage distinctly margined with crimson. Mr. F. Kinghorn, Sheen Nursery, Richmond, sent a plant of *Fuchsia procumbens*, first introduced to this country forty years ago, but lost, and only recently re-introduced. It is, perhaps, the most elegantly habited species in the genus; the fresh greenness of its pendent branches drooping in dense masses over the sides of the pot, reminds one of *Sibthorpia europaea*; while over the whole are diffused yellow-tubed purple-petalled, blue-anthered, erect flowers, which give the plant at once an attractive and, at the same time, novel appearance. It is a native of New Zealand, is perfectly hardy on sheltered rock-work, and, as a basket-plant for the greenhouse or conservatory, it is well worth attention. A good figure of this plant, from the pencil of the late Mr. J. T. Moggridge, will be found at t. 6,139 of the "Botanical Magazine." Messrs. E. G. Henderson sent a collection of double and single flowered *Cinerarias*, one or two of the double-flowered forms being certainly very effective, and well worth reproducing from offsets, if not from seed. Messrs. Dobson, of Isleworth, furnished a collection of well-bloomed, brightly-coloured *Cinerarias*, a sharp-pointed variety of the scarlet-spathed *Anthurium Scherzerianum* came from W. Arbuthnot, Esq., of Plawhatch, Sussex. Mr. B. S. Williams sent three small plants of the new hybrid *Franciscea magnifica*, a kind having fresh green oblong foliage and purple flowers, fully 3 inches in diameter. Mr. B. S. Williams also had a fine group of miscellaneous decorative plants, among which were the bronze-leaved *Dracena Shepherdii*, *Veitchia Canterburyana*, an elegantly-habited Palm, with fresh deep green drooping leaflets; *Toxicophlæa spectabilis*, with deep green shiny foliage, and axillary clusters of sweet-smelling snowy-white flowers. In the same group was likewise a young plant of *Plectocomia Andersonii*, a distinct and irregularly pinnate-leaved Palm, having long glaucous or silvery spinose petioles, and deep glossy green leaflets. Fine groups of decorative plants came from the Society's garden at Chiswick, including some well-grown examples of *Polyanthus Narcissus*, showy Alpine Auriculas, half-a-dozen fine pots of forced Solomon's Seal, some good Callas or Trumpet Lilies, and excellent pots of the rosy-flowered *Dielytra (Dicentra) spectabilis*.

Fruit and Vegetables.—Alicante Grapes, well-preserved, and in all respects in excellent condition, came from Mr. Redout, who had kept them in water since February last. Two good clusters of Black Hamburgh came from Mr. Bones, gardener to D. McIntosh, Esq., Romford. These were of the present season's growth; each cluster weighed nearly a pound, and was well coloured. Mr. Bones also had a dozen fine Tomatoes, of the Earley's Defiance variety. A brace of Tender and True Cucumbers, 2 feet long, came from Mr. J. Lane, gardener to Major-Gen. Fytche, Tyrgo Park, Romford, and to these the first prize was awarded. It is a fresh glossy-green coated variety, and one of the best in cultivation, either for table or for exhibition. Mr. W. Rapley, gardener to R. Hudson, Esq., Clapham Common, had a good brace of Marquis of Lorne, in excellent condition. Mr. T. W. Bond, gardener to G. A. Smith, Esq., The Beeches, Weybridge, sent two pot Vines, each bearing six bunches of ripe fruit, the variety being Foster's Seedling. Mr. Sidney Ford, gardener to W. E. Hubbard, Esq., Leonardslee, Horsham, sent six fine dishes of Apples, consisting of Royal Russet, Spanish Pippin (a plump golden-yellow fruit in excellent preservation), Dumelow's Seedling, Norfolk Paradise (a highly-coloured fruit of large size), and Alfreton, (a well-known culinary variety).

The same exhibitor also sent two dishes of Uvedale's St. Germain's and Beurré Rance Pears. Messrs. J. and C. Lee, Hammersmith, furnished plump specimens of Bess Pool, a well-known dessert or kitchen Apple, of excellent quality, especially when grown on deep rich soils. W. Terry, Esq., Peterboro' House, Fulham, sent two good clusters of Vanilla pods, ripened in a Pine stove. Mr. John Munro, Potter's Bar, exhibited fresh green fruit of his seedling Cucumber, Duke of Edinburgh, also a fine basket of Keen's Seedling Strawberry, from plants raised from offsets, with incipient rootlets attached to them. The same exhibitor likewise furnished three dishes of early-forced Grapes, consisting of Foster's Seedling, Buckland Sweetwater, and Madresfield Court.

First-class Certificates were awarded to the following new or rare plants:

Dracena hybrida (Veitch).—A robust and distinct-habited seedling, raised at the Royal Exotic Nursery, having broad lanceolate foliage of a bronze-green tint, margined with bright rosy-crimson, and streaked with creamy-yellow and bright rose. The young leaves on the plant exhibited were bright rose underneath, and delicate rose blended with cream colour above. It promises to be one of the most distinct and valuable of all the new varieties.

Daisy (Quilled) White Globe (Dean).—A robust and compact habited variety, bearing pure white, semi-hemispherical flowers, 1½ inches in diameter. It is a most profuse bloomer, the plant exhibited having on it thirty flowers and partly opened buds.

Rose Captain Christy (H. Bennet).—A first-class French Rose, having large full flowers of a delicate rose or rosy-lilac tint, the centre being of a deeper glowing rosy-hue, with a dash of salmon. The foliage is deep green, and of good substance. The wood is nearly spineless, and the flower has a very delicate Tea Rose-like odour.

NOTES AND QUESTIONS—VARIOUS.

Shading Pines.—Your correspondent, Mr. Muir, is perfectly right respecting the use of shading for Pine-apples, and particularly during the early spring months.—R. G. B.

Macadamia ternifolia.—This plant, enquired about by "K" (see p. 314), I have tried out of doors in the south of Ireland, and proved it to be tender. It is the plant which produces the fruit known in commerce as the Guayaquil nut.—W. E. GUMBLETON.

Dog's-tooth Violets.—In answer to "H. A." (see p. 320), I would suggest that his soil is too sandy for these plants; mine grow and flower in perfection in a strongish loam.—J. G. N. [Another correspondent adds that they are in too dry a position, and that if "H. A." does not remove them they may in time cease to treat him with even a sight of their leaves.]

American Dog's-tooth Violet (Erythronium americanum).—Can any of your readers tell me how to manage this beautiful plant so as to induce it to bloom? With me it runs about to considerable distances from its original position, and but rarely forms bulbs sufficiently strong to flower, though when once a bulb arrives at flowering size it generally continues to bloom year after year; I am, however, sorry to say that these cases are rare.—J. G. N.

Fruit Prospects in Worcestershire.—Peaches, Nectarines, and Apricots, which have bloomed vigorously, are setting freely, and, now that the season is so far advanced, people are looking forward to abundant crops. Owing to the long continuance of north-easterly winds and remarkable absence of sunshine, the opening of the bloom buds has been quite three weeks later this season than last year.—GEO. WESTLAND.

Rollisson's Telegraph Cucumber.—I can endorse all that Mr. Gilbert and Mr. Garland say of this excellent Cucumber. It is peculiarly a market-gardener's variety; there are here large growers of Cucumbers for the Nottingham market, and, though they have tried all the best varieties, Rollisson's Telegraph is the only one used. Care is needed in buying, otherwise you often get a Cucumber which is not Rollisson's.—N. H. P.

Rhododendron Countess of Haddington.—A noble specimen of this beautiful *Rhododendron* is now in flower in the conservatory at Furze Down, Tooting Common. It is bearing upwards of a hundred trusses of pale rosy-white flowers, each averaging from three to five flowers on a truss. Mr. Laing informed me that it had been even much finer than it now is, he having cut many flowers from it.—A. OUTRAM.

Explosion of Gas under Boilers.—If the stoker alluded to in "N.H.P.'s" note (see p. 336) were to force the greater part of the fire to the back of the furnace, and be careful not to cover it with the fresh fuel, a little space being left between the fuel and the boiler for the admission of air, the ashpit door being left 2 inches open, and the damper out about 3 inches, there would be no danger of explosions, as the fire left uncovered at the back consumes all gases that pass over it.—W. W. EAGLEBURST.

Thuopsis dolabrata.—This is one of the most beautiful of Coniferous plants, the rich massive foliage of which is, I think, unequalled by any other variety. A plant here measures upwards of 10 feet in height, and as much in width. It is symmetrical, branched close to the ground, of good habit, and perfectly hardy, but the laterals have a tendency to form leaders, which may easily be prevented by shortening to an outward growing shoot. No collection, however small, should be without this variety.—JOHN GARLAND, Killerton, Exeter.

Scillas from Seed.—*Scilla sibirica* is a general favourite, and *S. bifolia alba* flowering at the same time makes a pleasing companion to it. But to see the former in all its loveliness it should be planted in a thick line or as an edging, if only a yard long, and in a half shady position. With a little patience this may easily be done and at no expense. The bulbs are now seeding, and when the seed is ripe it should at once be sown thinly in pots, and the pots may be stowed away under a hedge or in any quiet place for two or three years, when a rich store—quite a treasure trove—will be found ready for planting out.—G. F.

International Potato Show.—The Committee have obtained from the Alexandra Palace Company a contribution of £30 to the prize fund, and have arranged to hold the show in the Alexandra Palace on the 29th and 30th of September next. As the amount of prizes offered exceeds £100, and many expenses must be incurred in securing a really representative exhibition, it is hoped the necessary funds will be forthcoming. The Committee have the assistance of Mr. Alderman Ellis as President, and Mr. James Abbiss as Vice-President. The Treasurer is Mr. James Crute, 88, Watling Street; the Hon. Secretary Mr. Peter McKinlay, 23, Upper Thames Street.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

CULTURE OF THE AMERICAN DOG'S-TOOTH VIOLET.

(*ERYTHRONIUM AMERICANUM.*)

THIS interesting plant formerly grew in the open border here, but its flowers were rarely seen. Some years ago I put a tuft of the bulbs in one of the stone compartments of the rock garden having a southern aspect, the soil being a mixture of peat and loam. As soon as the space became filled with roots flowers were freely produced, and on the 20th of April it was covered with yellow blooms. In these confined spaces the bulbs are better matured for flowering than they can possibly be in open borders, where the surface of the ground is generally seen covered with a mass of small green leaves proceeding from numerous unmaturing bulbs, having but few of the larger spotted leaves which generally accompany the flowers. All the species of *Erythronium* succeed well in rough stone boxes. We have now in flower the true *Erythronium giganteum*, *E. giganteum roseum*, and *E. grandiflorum*, while the flowering of *E. Nuttallianum*, and *E. Dens canis*, cultivated amongst the stones, is just over. Many of the latter, however, are still in bloom on the northern grassy slopes of the rock garden; they were thickly dibbled in, here and there, when the turf was first laid, and, being placed in all exposures, a longer flowering season of these interesting plants has been obtained. In such places they do not seem to multiply fast, as single flowers proceeding from the two or three spotted leaves are only produced. Owing to the beauty which these plants present, when grown on Grass lawns, they should be more employed than they now are for culture in that way. When grown in beds and kept undisturbed (unless for sub-division) they are all very well, but, when grown in borders, as is usually the case, the roots are frequently tossed about by the spade, and come up in all directions. Judging from the flowering of the *Erythronium americanum*, when their bulbs are matured in stone boxes, roots planted in moderate-sized flower pots, and placed under the surface of the soil in the open border, ought to produce flowers in exactly the same way as in the rock compartments, provided they are placed in a position where the bulbs can be properly matured. I ought to have stated that, in Grass banks with a southern aspect, the leaves are all ripened off before the first Grass cutting takes place, which is not the case on Grass slopes having a northern aspect.

Royal Botanic Gardens, Edinburgh.

JAMES M'NAB.

BEST KINDS OF VEGETABLES.

FOR cropping a garden, be it large or small, but few varieties of each kind of vegetable are needed; and it is a well-known fact that gardeners stand, as a rule, by their old acquaintances year after year, and usually disregard all much-belauded introductions put forward annually, which are often only old friends in a new dress. I freely acknowledge, however, that there have been some useful introductions brought forward now and then, although, speaking generally of vegetables, the old are as good as, if not better than, the new. Beginning with Broad Beans, can three better kinds be named than the English Long-pod—which has been known under many synonyms, and of which Carter's Mammoth Long-pod appears to be a selected variety—the Green, and the Broad Windsors? Some varieties, such as the Mazagan, may be a little earlier, but for general crops these named are not surpassed. Of Kidney Beans, Osborn's Forcing is good, and is one new introduction that has borne out its character. The next best are Sion House—if it can be had true—Fulmer's Forcing, Long-podded Negro for a general crop, and Newington Wonder. Hitherto, the three last-named have supplied all our wants for years. Among Scarlet Runners, Carter's Champion is perhaps the largest variety; but the old Scarlet well grown, I have always found to satisfy the most fastidious tastes. Of Beets, Dell's dark-leaved variety will satisfy anyone, whether used for salads or for the flower garden. This variety, which was amongst the first, if not the first, of the true dark-leaved section, keeps to its character, and is a good kind, making good roots and dwarf tops. Amongst Borecoles or Greens,

the Dwarf German Curled is about the best, when true; otherwise the common Cottager's Kale leaves little to be desired. The quality of Greens depends a good deal upon cultivation; subjected to high culture they are coarse, but, grown on moderately poor soil, the leaves are better curled, fewer, and more tender. The Broccoli list of some catalogues enumerates not less than thirty-three varieties. Of these, the following selection will meet all requirements:—Walcheren, entered in catalogues both as a Broccoli and a Cauliflower, is the best to succeed the Broccoli till late in autumn, and is quite as good as Grange's Early Broccoli, if not superior to it. After this comes White Cape, Early Purple Cape, Snow's Superb Winter White, Osborn's Winter White, Chappell's Cream, Dilcock's Bride, Hammond's Imperial Hardy (a distinct sort), Knight's Protecting, Early Penzance, Shearer's Late White, Gordon's Late White, Wilcove Superb, and, for the latest of all, and of which a quantity should be planted, Carter's Champion and Cattell's Eclipse. These will afford a succession till Cauliflowers come in. Among Brussels Sprouts, Scrymgeour's Giant is a long-legged and abundant cropper; and Dickson's Sprouts and the Imported Sprouts are the best. The Dalkeith variety comes true, and will suit those who like the Sprouts large and firm. Of Cabbage I count in one seedsman's catalogue, where "the most useful varieties only are given," no fewer than twenty-five different sorts; but the old Enfield market supplies our wants throughout the year, with Dwarf York or Little Pixie for early crops. Our selection of Cauliflowers is restricted to Early London and Walcheren, after trying most of the kinds recommended. The first is excellent for early or general crops; and the second, though not so white as some, is the hardiest Cauliflower with which I am acquainted, and the least liable to "button" in dry seasons. Veitch's Giant and Grange's Autumn are, for some, too large-headed. Concerning Celery there is much diversity of opinion. I grow only one red kind, Lawson's Superb Crimson, one of the best-flavoured, hardiest, and least liable to go to seed I ever grew. It is also dwarf, the leaves attaining great thickness and substance, which gives solidity to the heads. Of white kinds, the Crystal is very good. There are few or none of the Celeries, however, that are bad, and different sorts succeed in different soils. Endive, of which we want a hardier variety, has not received much attention from improvers. At present, Green Curled and Digswell Prize are the two best. The list of Leeks is also short; Musselburgh and Henry's Prize are first-rate. I now come to Lettuces, of which a long list encumbers some catalogues. For summer crops, the Paris white Cos is still unsurpassed; and the same may be said of its associate, the Neapolitan Cabbage Lettuce. I have tried many sorts, but keep to these two. For winter and spring, the Bath Cos and hardy green Hammersmith are amongst the best. The last is still one of the hardiest, earliest, and most tender, but goes to seed quickly if starved. Of Tomatoes, the common Large Red, Trophy, and Orangefield are the best. Onions form another long list of nearly thirty kinds. The best are Danvers's Yellow, James's Keeping (difficult to get true, and the best keeper), Deptford, Strasburg, White Spanish, Silver-skinned (a kind used for pickling), New Queen, and, for autumn sowing, the Tripoli. Nuneham Park, a variety of the White Spanish, is difficult to grow in some places with a small neck. James's Keeping, Yellow Danvers, and White Spanish are good kinds for the main supply. In some lists no fewer than sixty-five varieties of Peas, or rather names, are given; and I suppose, if all were enumerated, about one hundred sorts would be found in the market. The following are very generally grown and approved—Early: Ringleader (otherwise First Crop or Dillistones) and Daniel O'Rourke. Early Wrinkled Marrows: Advancer, Little Gem, and Alpha. Second early Round kinds: Auvergne, Early Emperor, Laxton's Supreme, Essex Rival, Dickson's Favourite, Wrinkled Marrows: Superlative (new), British Queen, Ne Plus Ultra (old, but unsurpassed), Veitch's Perfection, and Champion of England. I think it unnecessary to extend this list, and at present I say nothing about the most recent introductions. Passing on to Savoys, I would recommend autumn-sown plants of Drumhead for a general crop where the demand is extravagant for autumn and Winter Greens, and for other purposes Green Curled or Ulm. The list of Turnips is moderate. White Dutch is still the best for early crops, being the least liable to run to seed; and it should be in every sowing during the season, as it is liked for its colour and tenderness. Early Snowball is also good; but for succeeding the White Dutch, I like the American Strap Leaf. Orange Jelly is a fine yellow-fleshed Turnip, perhaps one of the best to eat; but it is used comparatively seldom, the colour not being liked. For winter crops Chirk Castle is the best, being very hardy and tender fleshed. I come now to Potatoes. Of early kinds and Kidneys, I still find Mona's Pride to be one of the best, and a good forcer; next to it is the common Ashleaf, Veitch's Ashleaf, and River's Royal Ashleaf; and to succeed these the old Lapstone. Early Rounds:—Handsworth Seedling is one of the best for forcing, but is inferior to

many in quality. Rector of Woodstock is also a good useful kind. For a second early main crop I have never grown any kind but Dalmahoy, a variety too little known in England; for an immense cropper and general good qualities it is one of the very best—but it is liable to disease; still I grow more of it than any other every year. Of late kinds, Regent's Paterson's Victoria, and the Fluke, are still the best. J. S. W.

THE CARROTS.

By D. GUIHENEUF.

THE Carrot grows wild in England and in many other temperate countries. The root is spindle-shaped, whitish in colour, from 2 to 3 inches long, and $\frac{1}{4}$ to $\frac{1}{3}$ of an inch thick, and has a strong smell. The flesh is whitish, fibrous, and insipid; leaves radical, elegantly divided in bipinnate leaflets, terminating in acute segments. The stem is about 2 feet high, and produces, from June to October, beautiful umbels of white flowers, the central one being abortive, and of a dark red colour. When seed is matured, these umbels assume a bird's-nest shape, which has given rise to the popular name by which the plant is known, viz., Bird's-nest. The seed is a greenish brown, four or five-ribbed, and covered with prickles. It possesses a strong but agreeable smell, and is frequently used in medicine. This plant is widely distributed over calcareous districts, in meadows, pastures, grassy banks, and by roadsides. It abounds in deep sandy soil, but is rarely found in poor ground, and these facts must be well remembered in cultivating the garden varieties. This root has been cultivated from the remotest times; for so long a time, in fact, that not even an approximate date of its first occurrence can be fixed. This has led many eminent horticulturists to believe that the garden varieties and the wild Carrot are two distinct species; but many powerful arguments can be advanced against such a theory. Firstly, no other wild plant but the *Daucus carota*, or wild Carrot, has been found that could have produced such roots, there being not the slightest botanical difference between them, even the scent of both the seed and the root being equally strong and identical in character in both plants. Secondly, the ancient Greeks and Romans cultivated Carrots, which led some authors to argue that the garden Carrot was a native of Southern Europe; but it is quite natural that the extraordinary skill and intellectual superiority of the Greeks should have enabled them to improve the wild Carrot with success, and to obtain roots similar to those now cultivated with such care all over the world. From Greece it soon found its way to the islands in the Mediterranean, as well as to Italy and Spain, in which country it has been cultivated for very many centuries. Then sprang up the celebrated Candie Carrot; but the famous Gerard hit upon the truth when he alleged that the Candie Carrot was not only grown in Candia but was found wild on the mountains of Germany, France, and Switzerland; had Gerard persevered in his researches, he would have found it growing wild in England as well. Another proof of the origin of our cultivated Carrots is, that roots similar to the garden kinds have lately been obtained from the wild Carrot by the late M. Louis Vilmorin, who, after several skilful selections, succeeded in giving fixity to many varieties of different colours, which are now well fit for table use. It has been said that the flesh of these new Carrots was more fibrous and less well flavoured than that of the old varieties; but, when they have had the advantage of as lengthened a period of cultivation as the older kinds, they will probably be as fine as, and perhaps superior to the latter. Although Miller says that, after cultivating the wild Carrot during twenty years, he did not see any improvement, it was no doubt because he did not act throughout with the necessary care, such selections requiring a good deal of patience, knowledge, and skill. Thirdly, by going attentively through a field of Carrots, especially the white and yellow varieties, many plants will be found showing a tendency to return to the wild kind, and this is commonly the case with the long purple Carrot. As a



Root of the Wild Carrot (*Daucus carota*).

proof of this, it may be mentioned as an established fact that, if a single root of the best sort be planted in a field among wild Carrots, the produce of the seed the following year will have much degenerated, and, should the worst plants of the seedling be selected and submitted to the same process for many years, the entire stock will, in course of time, completely revert to the wild Carrot type. Gardeners are well aware of this, and are very careful in planting their seed-bearing stock. The leaves of the Carrot are very ornamental; it is said that they were formerly used for adorning ladies' hair. If in winter a top of a Carrot be cut and placed in water under glass, leaves will spring up that are similar in appearance to a Fern, and are valuable for decorative purposes. Artificial flowers are also made from roots of the cultivated Carrot, and vegetable Ranunculuses may thus be obtained without any colouring. These flowers look very pretty on dishes on a dinner-table, and others similar in character may be obtained from Beetroot, Radishes, and Turnips.

Uses.

The Carrot is one of the most useful plants in domestic economy, inasmuch as it furnishes throughout the whole year a vegetable that is both wholesome and palatable. Its uses are very various, and it is found alike on the tables of the rich and poor. Its culture, too, is by no means difficult, and its produce, although generally inferior in quantity to that of Mangel, and sometimes of the Turnip, is superior to these roots in nutritive qualities; it is, however, no uncommon circumstance for an acre of White Green-topped Belgian to yield 25 tons, which is a larger crop than that of either Beet or Turnip frequently is. The saccharine matter contained in the Carrot amounts to 8.5 per cent. of its weight; but all efforts made to take advantage of this fact have hitherto failed. The quantity of sugar in Carrots varies according to soil, culture, and climate; and in those produced under a southern sky, saccharine matter is doubtless more abundant than in those grown in less sunny latitudes. If a Carrot be cut transversely, it will be found to consist of two parts; the exterior or rind, which is deep in colour, and which is the most tender as well as the most nutritious part, and the interior, which is of a paler shade, and always more or less fibrous and insipid in taste. It is the last-mentioned part that cultivators should strive to reduce by means of skilful hybridisation; and, in order to make certain that a good selection has been made, the lower part of the root of the selected plants may be cut off, and the remaining part examined and replanted. The French, who are the most difficult to please in respect to this vegetable, never make use of field varieties for cooking, except in cases of necessity. In France, also, where its cultivation is most extensive and the best carried out, all the known varieties are more or less made use of according to their value; but the culinary kinds are grown everywhere, even by the poorest people. Belgium, although having originated several varieties, is still far behind as regards varieties of the Carrot, inasmuch as several field kinds are still largely used there for culinary purposes. However, the culture of each variety is carried to perfection in that country. The celebrity once enjoyed by Holland for the production of seed of this vegetable, which was due to the climate and the soil, has much diminished of late years. In some parts of Germany its culture is carried on upon a large scale, but not generally so. One great fault of the latter country in respect to Carrot raising is that in almost every province the same varieties are found under different names; for example, the Frankfort, Erfurt, and Brunswick kinds are simply common varieties under these titles. England is in all respects the most backward in the culture of Carrots—for culinary purposes at least. The varieties grown in this country are less numerous, inferior in quality, and badly grown, compared with French kinds. In gardens this is most observable, and the consequence is the London markets are stocked chiefly with the Surrey Carrot, a tough variety, without flavour, and with a heart sufficiently woody to make a walking-stick. It is, moreover, difficult to cultivate, on account of the deep soil that it requires; while, on the other hand, the finer cooking varieties accommodate themselves thoroughly to soils of medium depth.

French Forcing Carrot (*Carotte très-courte à châssis*).—A French variety, the smallest and earliest Carrot, chiefly used for forcing. It is a great favourite among the Parisian market gardeners on account of its extreme earliness. The root is from $1\frac{1}{2}$ to 2 inches in size, nearly round, and terminates in a very fine tail. It is pale straw coloured when grown under glass during the winter, but scarlet when raised in open ground. The flesh is very tender and finely flavoured; and it has scarcely any heart. The top is greenish and hollow-crowned; the leaves few and small. This variety is extensively used on the Continent, and its cultivation ought to be much more wide-spread in England, affording, as it does, all the year round, a fair supply of fresh Carrots. Anyone visiting the Halles Centrales at Paris, in spring time, cannot fail to notice the cart-loads brought every morning by the market gardeners to that market, as early as February. Recently, bunches of this variety have made their appearance in Covent Garden Market, but the freshness of such tender roots is spoiled by their journey from Paris to London. The annexed out is the true shape, and of the



Early French Forcing Carrot.

natural size, but inferior stocks producing conical roots neither so succulent nor so early, are often met with. This valuable Carrot ought to be used only for forcing, and should never be grown in the open ground. Sowings should be made on hotbeds having a medium temperature, from November to February, for use from February until May. For early crops sown in warm borders, however, the Scarlet Horn will be found to be far better adapted. Market gardeners sow the Early French Forcing Carrot in August and September, and, after protecting it in winter, sell it in the spring for newly-forced Carrots, to which they bear some similarity after a sharp brushing before they are sent to market, but the difference may be easily detected by their deep scarlet colour, and the leaves being entirely stripped off. In addition to this, the skin is rough and the flavour much inferior, whilst newly forced Carrots are smaller, of a straw colour, with a shining skin, and are always tied up in bunches by their long thin leaves; both may now be seen at Covent Garden. Special attention should be paid to this variety, which really deserves general cultivation. The following are its synonyms—French Forcing Carrot, French Forcing Horn Carrot, Very

Early Forcing Carrot, Very Early Scarlet Horn Carrot, Very Early Short Horn Carrot, Early Forcing Horn Carrot, Very Early French Carrot, &c. French; *Carotte grelot*, *Carotte Très courte à forcer*, *Carotte Carline*, *Carotte toupie*, *Carotte à châssis*. German; *Möhre—allerkürzeste früheste zum treiben*, *M. sehr kurze stumpfe früheste zum treiben*.

Scarlet Horn (*Carotte rouge courte*).—A popular early variety, the most generally cultivated for the first crop in the open



Scarlet Horn.

Intermediate Scarlets.

ground. The root is deep scarlet, $2\frac{1}{2}$ to 3 inches long, and 1 to $1\frac{1}{2}$ inches thick. It is nearly cylindrical, slightly tapering, and terminates abruptly. The flesh is very tender, and highly flavoured. The top is greenish, and hollow crowned; and the leaves of a medium size. It can be used for forcing exactly like the preceding kind, but being of a larger size it is not quite so early, therefore the best time for sowing is in February, on a warm exposed border; and, if well protected, in case of severe weather, a fair crop of new Carrots may be expected by the beginning of May. Sowings made subsequently from March to May will afford a fair supply during the whole summer where large roots are objected to. On account of its small size it is not suitable for winter storing. This kind is often mistaken or sold for the last-mentioned, although the two plants differ much, both in size and earliness. The following are its synonyms:—Early Horn Carrot, Early Scarlet Horn Carrot, English Horn Carrot, Dutch Horn Carrot, *Carotte rouge courte hâtive*, *Carotte rouge courte d'Hollande*. &c.

Intermediate Scarlet (*Carotte rouge demi-longue pointue*).—The best variety for general use; it has beautiful scarlet roots, 5 inches long and from 2 to $2\frac{1}{2}$ inches thick, tapering and sharp-pointed. The flesh is highly flavoured and of the best quality. The top is greenish, hollow crowned, with a few vigorous medium-sized leaves. This excellent kind ought to be grown for the main crop in every garden, as it is very hardy and a large cropper. It is the best and the most useful kind for winter storing; it grows in almost every kind of soil, and, provided the plants are kept at a sufficient distance apart, it will resist drought better than any other garden kind, besides losing little or nothing of its valuable properties. Sow from March until June, in rows from 9 to 12 inches distant. Thin the plants as soon as possible, and keep them from 4 to 5 inches apart, according to the quality of the soil, as soon as they attain the size of a pencil. Hoeing and watering, in case of extreme dryness, will aid development and ensure a good crop of excellent Carrots. It is known under a great many names, according to the country in which it is grown; and, on account of its productive qualities, it has been cultivated sometimes in the field, where from 14 to 15 tons of roots have been produced to the acre.

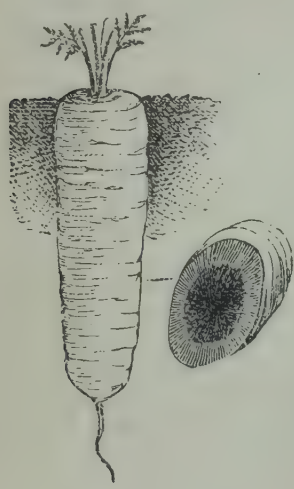


Intermediate Scarlet Stump-rooted.

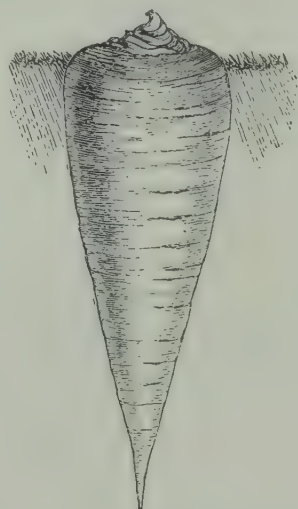
Intermediate Scarlet Stump-rooted (*Carotte rouge demi-longue obtuse*).—A French variety, similar to the last described in its quality and uses. The root is deep scarlet, from 4 to $4\frac{1}{2}$ inches long, from $1\frac{1}{2}$ to 2 inches thick, and almost cylindrical in shape. The

root is stumped, the top greenish in colour and hollow crowned. It is an improvement on the preceding kind, which it has supplanted in many gardens, though less hardy and occasionally more affected by drought. It is a valuable variety for autumn and winter storing. It has enjoyed a popularity in France extending over thirty years, and is now much used in America, Germany, and Belgium; but its introduction into English gardens has been very gradual and partial. It requires the same culture as the Intermediate Scarlet Carrot, and is an exceedingly valuable kind that should, if possible, be always added to the list of winter vegetables.

Intermediate Nantes Scarlet (*Carotte rouge demi-longue Nantaise*).—This is of recent French introduction, having a close analogy to the two preceding varieties. The root is a deep red in colour, $4\frac{1}{2}$ inches long, from $1\frac{1}{2}$ to 2 inches thick, and bluntly cylindrical in form; the top is greenish in colour, with a hollow crown. The leaves are of a medium size; the flesh is very superior in flavour and quality, the heart being far less developed and much more tender than in other varieties, and both for sauces and stews it is a most desirable kind. It is a most valuable acquisition to the kitchen garden, and it may be said that its value is thoroughly appreciated, for its cultivation has become very extensive for the short period during which it has been known. Although it is an earlier variety than the two preceding ones it is not sufficiently so for forcing. Sown from March to June it will produce an excellent crop in the autumn and throughout the winter. On account of the delicacy of



Intermediate Nantes Scarlet.



James's Intermediate.

this Carrot, considerable attention and care must be devoted to it during its growth, which will be amply repaid by the results. It is also called *Carotte sans cœur*.

James's Intermediate Carrot.—This is a favourite in English gardens. The root is scarlet, is 6 inches long, from 2 to 3 inches thick, and conical and sharp-pointed. The top is green, flat, and not hollow-crowned; the leaves are vigorous, the flesh scarlet and of good quality. This hardy variety grows almost in any soil and stands bad weather well. It keeps well and is, therefore, suitable for winter use. It should be sown from March to May in rows 12 inches distant, leaving the plants 4 or 5 inches apart. On account of its large producing capacity it is sometimes grown as a field crop. This variety is probably the French Intermediate Scarlet which, after many years cultivation in deep rich soil, has assumed other characteristics, for the two varieties are now perfectly distinct both in shape and quality, the latter being somewhat smaller and more tender, and the form of the top being strikingly dissimilar. It is an excellent variety for small gardens which receive little attention.

Intermediate Luc Carrot (*Carotte demi-longue de Luc*).—This is a variety of the preceding which has been in the markets for a year or two. It is of medium size, and it combines the qualities of the Nantes kind with the earliness of the Scarlet Horn. The root is a deep red in colour, and bluntly cylindrical in shape. The leaves are very small. It has, like the Nantes variety, little heart, and is very early; it is consequently fit for forcing. If the accounts given of the advantageous qualities of this variety are not exaggerated, this is another excellent addition to the best kinds, uniting earliness and good quality, and therefore it is preferable to the Early Horn.

Altringham.—An English variety, readily distinguished from any other. It is said to have originated about sixty years ago, at Altringham, a village in the vicinity of Chester. Root, slender, somewhat crimped, from 9 to 12 inches long, and from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches thick. In shape it is cylindrical at the upper part, tapering to a point at the lower end. In colour it is of a beautiful red, with a green conical top, showing about 1 inch above ground. The flesh

is of the first quality, deeply coloured, and almost without any fibres. The heart is much reduced, comparatively speaking. This variety was much used for colouring butter before the discovery of Annotto. On account of its good qualities it is often used for



Altringham.



Long Red.

cooking, for which purpose it is far preferable to the Surrey, but both these varieties should in all gardens make room for the more delicate-flavoured intermediate kinds. Sowing should be made from March to the end of May, according to the climate and weather; heavy soils must be avoided as much as possible, the fragile character of the root rendering it difficult to pull. Twelve-inch drills and 4 to 5 inches between the plants are sufficient to obtain a fine crop. Other and less valuable kinds are often supplied for it. This variety is known also under the following names:—Long Red Altringham, Superb, Cheshire, Green-topped, Rouge longue d'Altringham.

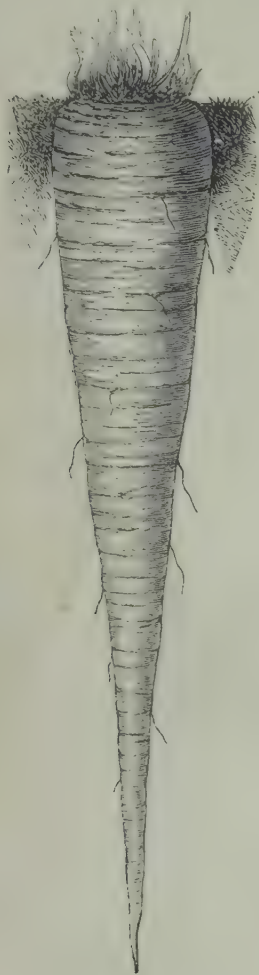
Long Red (*Carotte rouge longue*).—This is an old standard variety, the root of which tapers gradually, and is almost entirely buried in the ground. In colour it is a deep orange; from 9 to 10 inches in length, and from $1\frac{1}{2}$ to 2 inches in diameter. The top is flat, and occasionally green; the flesh is yellowish inside, and the heart of a moderate size, but tolerably hard. It is the most succulent field variety, and is still used in English, Belgian, German, and American kitchens. The size and shape of the root is very variable, according to the soil and the climate, sometimes assuming a shorter and thicker form, which ought to be preferred. This variety may be occasionally seen among the Surrey Carrots in Covent Garden. It should be sown in deep soil, in 15 inch drills, the plants being thinned to 5 or 7 inches apart. On account of its colour it is often called the Long Orange Carrot, and also the Studley.

Long Lemon (*Carotte jaune longue*).—This is seldom cultivated. The root is pale yellow, and spindle-shaped; slender, from 8 to 10 inches long, and from $1\frac{1}{2}$ to 2 inches thick. It is generally completely concealed in the ground, but sometimes has a top of $\frac{1}{2}$ an inch, which is green. The flesh is cream-coloured, sweet-flavoured, and of good quality; it is a moderate cropper, but a good keeper. It is confined to some provinces, and will never come into general use, other kinds being far preferable. Sow from April to June in deep sandy soil, in 12-inch drills, and thin the plants 4 or 5 inches apart. It is only useful as food for horses, cattle, or sheep.

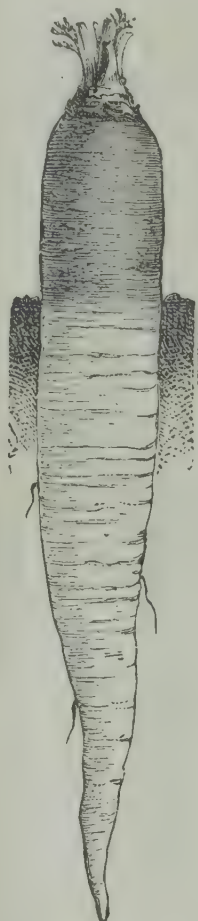
Short Lemon (*Carotte jaune courte*).—A variety of little use, and very seldom cultivated. The root varies considerably in shape. It is pale lemon in colour; 4 inches long, from 2 to $2\frac{1}{2}$ inches thick, tapering, is generally surrounded with other small roots, and does not grow above ground. The flesh, of a medium quality, is often coarse, whilst the top is hollow crowned. The leaves are dark green, trailing on the ground. Properly speaking, it is not a selected variety, for similar roots can be obtained from the wild Carrot after a few years selection.

Long Surrey.—These beautiful roots are grown in, and brought from, Surrey and other counties; the deep soil required for their full development rendering their cultivation about London unprofitable. The root is a deep orange colour, from 16 to 20 inches long, and from 2 to 3 inches in thickness at the level of the ground. It is very slender, and the longest of all the Carrots, and grows entirely in the ground. The top is flat, and the base of the foliage large and swollen by the decay of old leaves. The only valuable quality of this variety is its capability of keeping in a perfect condition almost the whole year through, the woody, fibrous texture of its flesh resisting every injury. Even the heart, which is fully developed, does not become tender by boiling; yet it is a favourite vegetable, and is daily used in English kitchens; and the large quantities brought to Covent Garden during the winter attest that Carrots of a fine quality are little known in London. The Surrey is a field variety wholly unfit for the table, though, doubtless, it will continue to find its way there for a long time, its abundant crop permitting the grower to sell it cheap, and its fine appearance being favourable to its sale. Its probable origin was the Long Red variety in the deep soil of some part of England, but these two kinds are perfectly distinct now, though the seed of one is often sold for that of the other. The Brunswick, so much cultivated in Germany, is similar to this variety. Sow from March to May, in deep-trenched soil, keeping the plants at a fair distance from each other.

Green-top Long-red (*Carotte rouge longue à collet vert*).—The root of this variety is orange coloured; from 12 to 15



Long Surrey.



Green-top Long-red.

inches long, and 2 inches in thickness. In shape it is cylindrical and slender at the lower part; 2 or 3 inches of it grow above ground, and this part is of a greenish-brown. The top is conical, and the flesh orange-coloured. It is fragile, productive for field culture, and growing so much above ground is easily pulled, advantages much appreciated by cultivators. Though known, comparatively speaking, but recently, it is largely cultivated in France, Belgium, Germany, and America, and will certainly become a popular variety. It is very hardy, and grows well in every kind of soil, but does not keep well. It must not be grown in gardens, being fit only for field culture. On account of its yellow-red colour it is known under several names, according to the country in which it is grown; for instance, Orange Belgian, Large Orange Belgian, Orange Belgian Green-top (America); Möhre grünkopfige riesen (Germany). It should be sown from April to May in 15-inch drills, the plants being kept 5 to 6 inches apart.

White Breteuil (*Carotte blanche de Breteuil*).—This is grown in some localities only, and is of little use. Its root is 7 inches long and 3 inches thick, cone-shaped, tapering, and sharp pointed.

It is crimped and neat in shape, and grows altogether embedded in the soil. The top is flat and somewhat sharp-edged. The flesh is of a better quality than that of the White Vosges, described below (of which it is a variety), and it succeeds equally well in shallow soils, and keeps well.

Red pale Flanders (*Carotte rouge pâle de Flandres*).—This old French variety, that used to be largely cultivated, has lost much



Red pale Flanders.



White Vosges.

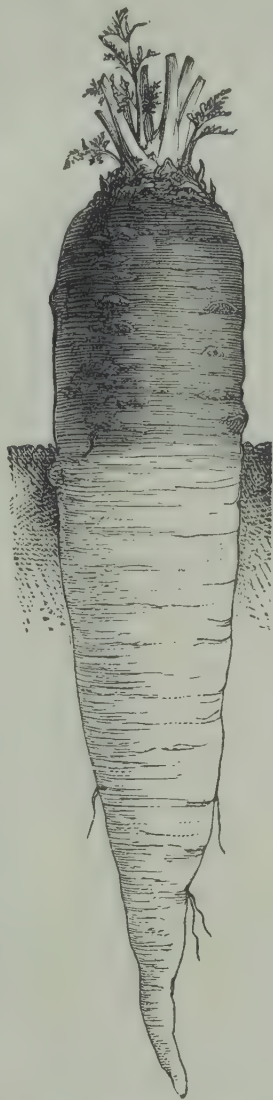
of its celebrity, its cultivation being confined to some localities only. It is certainly the hardiest, and keeps the best of all the Carrots; it is of a variable quality, has a pale red root that is conical shaped, slender at the lower extremity, and grows entirely in the ground. The heart is very large; the top flat, and almost covered by the basement of the leaves, which are strong and vigorous. It will grow anywhere, even in the poorest soil, and will remain long fit for use after other sorts have disappeared. It is only fit for field culture, but in no case does it deserve very extensive cultivation.

White Vosges (*Carotte blanche des Vosges*).—An old French variety, much praised some fifty years ago, but now only cultivated locally. The root is conical, tapering, sharp-pointed, and from 5 to 7 inches long, and 2 to 3½ inches in diameter. Its colour is whitish-yellow, and the root is wholly below ground, except occasionally a small greenish top. The flesh is firm, very variable in quality, and sometimes woolly. This is a good variety for heavy or shallow soils, and will succeed in the poorest, where other kinds will fail. It is often used in the kitchen late in the spring, being a good keeper.

Belgian White Horn or White Transparent Carrot.—A very curious and interesting variety of the White Vosges. The root varies much in size and shape, but is usually from 4 to 5 inches long, and from 1 to 2 inches thick; it is spindle-shaped, slender, or conical, and grows completely buried in the ground, with a white and very tender smooth skin. The flesh is white, transparent, fine grained, and of superior quality. It is a good Carrot for the kitchen, but objected to on account of its transparent colour. It is the *Carotte blanche transparente* of the French.

The Purple Carrot (*Carotte violette*).—This is a singular variety, now much less cultivated than heretofore. Its origin is very uncertain, but its introduction into France is attributed to Baron de Bendanna, who is said to have brought it from Spain, although one of its French names (*Carotte noir de l'Inde*) seems to assign to it another birth-place. Amongst Carrots that have a tendency to degenerate are often found roots that bear much resemblance to this variety, so far as colour and form are concerned. They are, however, always somewhat smaller and less savoury. The root is fusiform and tapering, 10 inches long, and from 1½ to 2 inches in diameter, but sometimes growing to an unusual size; and of a deep violet colour. The flesh, which is fine in the grain, is of a violet tint, but yellow or yellowish at the centre. It contains a great deal of sugar, and its quality varies very much. The leaves, which are of a deep green, grow horizontally. Its use for culinary purposes is very limited, on account of the disagreeable colour which it imparts to sauces in which it is used. It grows well in damp soils, and should not be sown before May, or the plants are apt to run to seed. In fact, its culture offers few advantages. It is also known under the name of Deep Red Carrot.

Green-topped White Belgian (*Carotte blanche à collet vert*).—A standard variety of Belgian origin, well deserving its high reputation. The root is whitish, from 12 to 14 inches long, and from 2 to 3 inches thick, bluntly tapering; a third part of the entire length grows above ground, is entirely green, and is rounded off towards the top. The leaves are dark green, large, and vigorous; the flesh white, of a good quality, but is never used in France for either soups or seasoning, as stated in some American reports, but appears to be appreciated in English cooking. This is a mammoth variety, and the largest cropper of all the Carrots, often producing 20 to 25 tons to the acre, besides being very hardy, and easily pulled. It is extensively used in field culture all over the Continent, no other root being of greater assistance to the farmer in keeping his live stock in condition through the winter. The Red Horn Carrots contain, it is true, a much larger proportion of nutritive matter than this kind, but they are so inferior in productive capacity that no advantage is gained by giving them the preference over the White Belgian for field cultivation. The time for sowing the latter varies according to the soil and the state of the weather, from April to the beginning of June; if later, the roots have no time to attain their full growth. In some countries the leaves are cut down two or three times to within a couple of inches of the top for green food for cattle, but this practice is very injurious to the roots and ought to take place only once, and then only a few days before pulling up the crop; 15 inch drills, and the plants 5 or 6 inches apart, is generally sufficient room for this kind. The stock of this Carrot is generally bad, and its cultivation is not understood in England. A fine specimen root is seldom exhibited anywhere. Its synonyms are large White Belgian Carrot, and White Green-top Belgian Carrot.



Green-topped White Belgian.

White Orthe (*Carotte Blanche d'Orthe*).—A variety of the preceding kind, held in great esteem by all who have tried it, though it has not been long in general cultivation. The root is cream coloured, 10 or 14 inches long, and 2 or 3 inches thick, cylindrical, and bluntly tapering at the lower extremity. It grows entirely embedded in the ground, or with a 1 inch top, which is greenish and flat or slightly conical. The flesh is white, and of better quality than that of White Belgian. The annexed cuts represent two forms of this Carrot, and show its affinity to the last-mentioned variety, to which it is superior in succulence and fleshiness. It is an excellent variety, a large cropper, with roots beautifully shaped, but requires a good soil to develop it thoroughly. It deserves to be largely cultivated, and should be sown from March to May for agricultural purposes only.

Wild Improved.—Varieties have, as previously stated, been obtained from the wild Carrot by careful selection; their shape and quality are not yet fixed, and vary according to circumstances. Its red, white, and yellow varieties, which are occasionally cultivated, are said to resist drought better than common sorts, besides being very hardy. The flesh is firm, sweet, of a good quality, and fit for kitchen use. In size they are something like the Intermediate Scarlet, but are more conical in shape. From such varieties, all other kinds might be obtained; but the result would probably be only a reduplication of the existing kinds, and consequently of little value.

Carrot Seed.

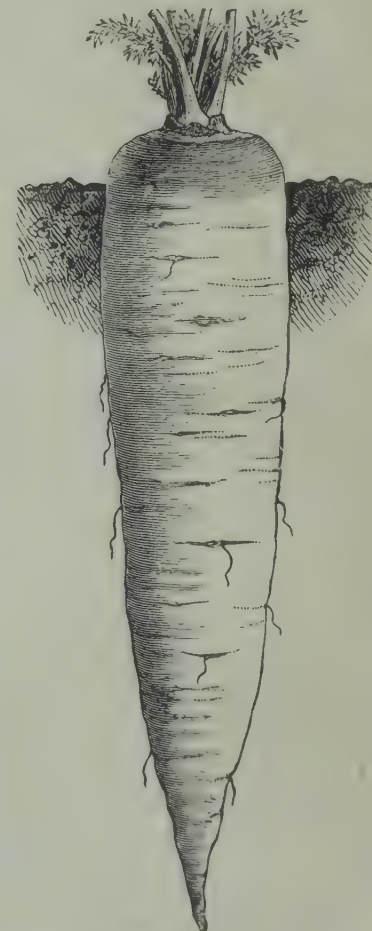
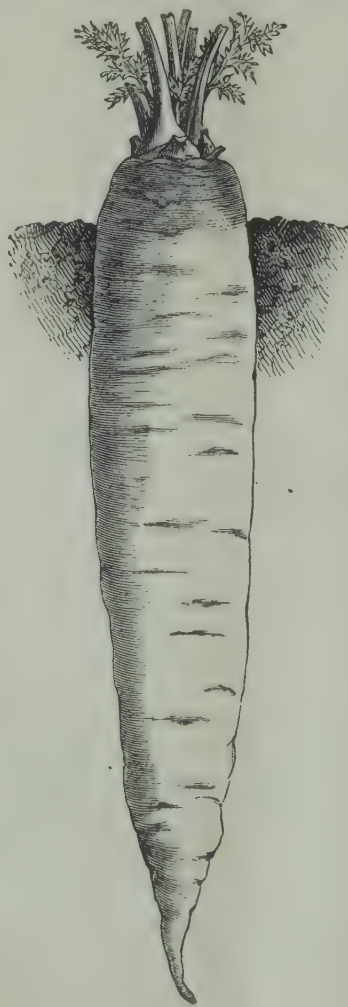
On account of its numerous bristles, Carrot Seed is somewhat difficult to sow with regularity; therefore, it is mixed with sand or dry soil. This difficulty is obviated now by buying clean seed from seedsmen—a practice carried on on the Continent long before it was in England. Laying the seed in wet sand or wet loam a few days before sowing, in order to stimulate germination, was once much practised; but, partly from the trouble, or partly from want of skill, this method is now seldom employed. It may, however, prove advantageous under some circumstances; for instance, in forcing and sowing in the open ground, where drought is to be apprehended. In the United States, it is the practice to soak the seed in tepid water

for a day or two, and then to mix it with plaster or ashes. Carrot seed retains its vitality for four years; but if not threshed out, and stored in its umbels, it will last five, or even six, years.

Cultivation.

Carrots require a deep, light, warm soil; well trenched, and previously well manured. Sowing must be effected in dry weather; for, should a shower happen soon after the seed is in the ground, the crop will, in most cases, be a failure, if not sown again immediately. Drills ought to be preferred to broadcast sowing, there being no possibility with the latter of attending to the crop conveniently.

Forcing Carrots.—The French Forcing and the Scarlet Horn Carrots are the best for this purpose, but the first is to be preferred. Prepare mild hotbeds 2½ feet high in November or December, and 1½ or 2 feet in January or February; put on the frames, cover the bed with 5 or 6 inches of rich soil or mould, and, as soon as the whole is sufficiently heated, sow the seed broadcast, cover with half-an-inch of mould, smooth the surface, and cover the glass with mats until the seed comes up. Should the interior get dry, give a slight watering, but be careful of damp. When the plants have four or five leaves thin them half-an-inch apart; admit air as often as the temperature will allow of it, which will give strength to the seedlings. Take care the heat does not exceed 60° during the day and 50° at night, which may be easily regulated by tilting the glass. In the case of sharp frost covering with mats is preferable to artificial heat. Shading, if needed, must not be omitted. Sowing in November, if carried on by practical men, will produce fine young Carrots at the end of February, which will last through March and April. Subsequent sowings—in December for March to April, in January for April to May, and, lastly, in February for April to June—must be attended to as required by market gardeners; but, in private gardens, the first bed should be made in November and the second in January; these will afford an ample supply until new open-ground Carrots are fit for use. Where frames are not available prepare, at the beginning of February, in some warm corner, a bed of hot dung mixed with leaves, covered with 4 or 5 inches of mould; sow the seed and protect with mats supported with sticks or other apparatus. As soon as the seed comes up remove the covering every day as frequently as



White Orthe.

the weather will permit, and the crop will be ready from the end of April to that of May. Parisian market gardeners mix seeds of Radish and Lettuce with those of Carrots, the former being ready for use before the Carrots, which are then left to produce a second crop, a practice not advisable, nor is that of planting Cauliflowers amongst forced Carrots.

Open Ground Culture.—For the first crop sow in February, on a warm, dry border, the Scarlet Horn Carrot, in 5-inch drills; cover the seed with half-an-inch of decomposed mould; when the young plants have formed a few leaves, clear off the weeds, and thin them to 1 or 2 inches apart, hoeing and watering as required. The crop should be ready by the end of May, and will last until the general crop comes in. In June sow the same kind of Carrot again, where small roots are preferred.

General Crop.—Intermediate Scarlet, Intermediate Stump-rooted, and Intermediate Nantes, are the three best varieties for general crops. Sow them from March to May (the latter month for winter Carrots) in well-prepared soil, in 9 to 12-inch drills, half-an-inch deep. As the Carrots make their appearance, hoeing, weeding, watering, and thinning them to half-an-inch apart, should be duly attended to. So soon as the plants attain the size of a lead pencil, thin them to 3 or 4 inches apart without hesitation. Thinning generally receives too little attention in every country; and the Carrots, crowded when young, are left to be taken up for use when they have attained sufficient size. In most cases, the ground gets dry and hard, and thus prevents the lifting of the roots, which are then left until the autumn, when only small, useless Carrots are the result.

Autumn Sowing.—In August and September, select a warm border. Sow French Forcing or Scarlet Horn Carrot, as for the early crop. The roots must remain in the ground the whole winter; but, if they are well protected and the bed is covered with an inch of mould, fine little Carrots will be ready from February until May.

Field Sowing.—No roots succeed better and are more easily cultivated in the field than Carrots. Select a rich soil, deeply trenched, and previously well manured. A little addition of salt will produce excellent effects. Sow from March to May, in from 10 to 15-inch drills, keeping all the plants 4 or 5 inches asunder, according to the variety. Weeding and repeated hoeings will ensure an abundant crop; but be careful in choosing dry weather for such operations.

Storing.

Garden Varieties.—In October, before the frosts occur, and on a fine day, take up the crop, cut the leaves $\frac{1}{2}$ inch from the top, clear the roots from soil, and store them at once in a cold cellar; there arrange them in tiers, spreading between each a layer of sand or dry soil, up to the height of 3 feet, the length being determined by the quantity of roots; two boards will secure the ends of the pile. By this means the roots can be easily and often examined, and those that are decayed removed. On the first symptoms of vegetation appearing, pull down the pile and build it again, and this method will enable the Carrots to be kept in a good state as late as possible. Another method—In open ground, in a dry place, remove the soil to the depth of 1 foot, trench the bottom, adding some sand if possible; plant the roots vertically close to each other, and protect from frost and from wet. The objection to this plan is, that decay cannot be attentively watched, and vegetation is much more liable to be excited, to prevent which the roots must be lifted and again buried. Heaps should be avoided in the case of garden varieties.

Field Varieties.—On a fine day take up the crop, clean the roots of soil, and store them in a cool situation beyond reach of frost, in moderate-sized heaps, which must be moved three or four times in the course of the winter to prevent fermentation and decay. However I have often seen Carrots harvested on a rainy day, and stored as taken up, keep until April, as fresh as in the autumn, provided they are kept cool. Cutting the top of each root as soon as harvested has been advised to prevent vegetation, but such Carrots do not keep so well as the others, and lose a great deal of their flavour; cutting the leaves right off the top, must be done to agricultural sorts only.

Disease and Insects.—Rust only is to be feared, and this occurs generally from the roots being grown in wet soil or having suffered from dryness in summer. Too much fresh dung will also provoke it. There is no effective remedy for it, but salt and quicklime applied to the ground before sowing is an excellent preventive as well as fertiliser. At spring-time, in hotbeds or borders, the young plants of the first sowings are sometimes entirely destroyed by a small spider. Gardeners watching young Carrots are surprised the next day to see that every plant has disappeared. Soot spread over the drills, or the entire bed, will effectually prevent such a disaster. Snails and slugs are very fond of young Carrots, one of them being able to destroy a small bed in a single night. Quicklime spread over the young plants (which it does not injure) and around the beds, will secure the crop; for it needs but to touch one of these insects with it, and it is instantly killed.

THE INDOOR GARDEN.

AMARYLLIS (HIPPEASTRUM) HENDERSONI COCCINEA.

THE coloured illustration which you have given (p. 346) of this *Amaryllis* is, to me, unusually interesting, as I have seen the plant, which is one of the most remarkable and stately among *Amaryllids*. The flower-stem, which has a delicate blue-green bloom, rises perfectly erect, to a height of 18 or 20 inches, and is crowned with two or three flowers, each measuring from 6 to 7 inches across. The marking of the petals is both unusual and striking. About half the petal, next the centre, is of a fine velvety red, terminating abruptly, with a few irregular freckles of the same colour, which extend for a short distance along the longitudinal veinings. The rest of the petals, to the points, is of a rich full cream colour, slightly shaded on the veins with a greenish tone, which is more conspicuous on the back of the flower than the front, except in the centre, where, at the base of each petal, a pointed ray of very vivid green is seen, forming a six-rayed star of great brilliancy. Messrs. Henderson have succeeded in raising two varieties of this splendid addition to the *Amaryllis* family, one having the dark portion of the petals of a deep crimson tone, and the other having the corresponding portion of the petals of a rich velvety maroon-scarlet. It is the last-named, and most brilliant, variety that you have figured. As in many of the *Amaryllis* family, the foliage does not attain its full growth till after the decay of the flower. Young bulbs are formed in a somewhat unusual way in this variety; they occur on the root-fibres, at some distance from the parent bulb, often at a distance of 2 to 3 inches. As soon as they have thrown out fibres of their own, the connecting link with the old bulb may be cut, when they grow independently, and, as soon as their foliage has died down, they may be removed and put into separate pots, and will probably flower in the second or third year. As a table ornament, a plant of this remarkable *Amaryllis* or *Hippeastrum*, placed in an ornamental vase, has a striking effect. It has formed one of the chief attractions of the Wellington Nursery during the early part of the present spring, where a number of plants of it, when seen in flower together, never failed to arrest attention. No collection of *Amaryllids* will henceforth be complete without it. H. N. H.

AUTUMN AND WINTER BLOOMING PLANTS.

Sericographis Ghiesbreghtii.—This is, perhaps, the most serviceable of all the winter-blooming plants, as it is easily grown, free-flowering, very effective, and stands well in a moderate degree of heat, very little, if any above that of an ordinary greenhouse, provided it is light and dry. The foliage, too, is of a most pleasing glaucous-green colour, setting off the light feathery scarlet *Justicia*-like flowers to great advantage. Few things are more effective than this *Sericographis* for grouping in jardinières or mixing with other plants, as it associates well with most on account of its light, easy habit of growth. For mixing with loose plants of *Deutzia gracilis*, or *Eupatorium ageratoides* it is most effective, and has done good service in the conservatory here, associated with these and other plants of similar character. Perhaps the most pleasing group has been a jardinière of this mixed with *Libonia floribunda* and *L. penrosiensis*, the latter a most interesting plant, the result of cross-breeding between the *Sericographis* and *Libonia floribunda*. It has exactly the leaves and habit, in miniature, of the *Sericographis*, while the flowers partake in an equal degree of the character of the two parents. The trio are invaluable for winter decoration, being very chaste and effective, and harmonising well together. The whole of them should be propagated at once, so as to form useful plants by the autumn. They strike freely at this season in close moist heat, and as the treatment necessary for the *Sericographis* will suit the *Libonias* also, I will simply treat of the former. The cuttings, when struck, should be potted off singly in the ordinary way, in a mixture of peat and loam in equal proportions, or, failing the peat, some well decomposed leaf soil may be substituted, to which should be added a small quantity of sand. The plants should then be replaced in moist gentle heat, and shaded on bright sunny days till they get established, after which they should be subjected to plenty of light by placing them on shelves near the glass. Continue to pot in the same kind of soil as they advance in growth. As the days lengthen the plants should be plunged in a pit or frame, in a bed of gently fermenting leaves. Here they will require slight shade during the summer on hot sunny days, but it should only be on for a few hours, and the plants should be well syringed and shut up early in the afternoon to induce them to grow freely. The ends of the shoots should be nipped out once or twice during the early part of the summer to

keep the plants bushy and compact, and towards the end of the season the lights may be removed for a few hours when the weather is favourable, to help to mature the growth. The *Libonia floribunda* flowers much more freely when treated in this way.

Rivina humilis.—This is one of the most useful and effective plants which we have for table decoration; and, by growing a few plants of it in succession, it may be had in good condition all the year round. Plants that bear berries are always prized for table decoration, as they associate better with the surroundings than do plants that bear bloom only. This has the double recommendation of bearing both fruit and flowers at the same time, and in the greatest profusion, even in the case of small plants. Unfortunately this plant has one drawback, and that is, after the berries attain a certain degree of ripeness they drop off a little too freely. For table decoration perhaps the most pleasing and effective are dwarf standards, with fine clean stems of a foot or so high, as in this way they show off their drooping bunches of rich-coloured fruit to the best advantage. Plants raised now, either from seed or cuttings, will attain a sufficient size for decorative purposes next autumn and winter; and, if required large for summer display, by means of a shift or two they may be grown to almost any dimensions. They are so easily and quickly raised from seed that it is scarcely worth while to propagate them in any other way. The seed should be sown in peat or finely-sifted leaf mould, and placed in heat to vegetate. As soon as large enough to handle the young plants should be potted off in small pots, and be replaced in moist heat to give them a start; as growth proceeds, all the lateral shoots should be pinched out till the plant attains sufficient height to form the stem, when the top may be stopped in like manner, leaving sufficient buds to break so as to form the head. In nipping out the laterals care must be taken not to injure the main leaves, or it will weaken the plant. As soon as the heads break fairly into growth the plants may receive their final shift into 6 or 8-inch pots, according to the size of the vases intended to receive them. They should then be placed in light airy positions to induce them to set plenty of fruit, which they generally do in a very free manner. During autumn and winter it will be necessary to keep them in a cool stove or intermediate house, in a temperature ranging from 50° to 60°. Should the heads become too large at any time, they may be cut back or thinned out to any extent, as they soon break freely into growth that blooms and fruits in quick succession.

Fuchsia serratifolia.—This fine old Fuchsia appears to be but little known, or its merits as a winter-blooming plant would bring it into more general cultivation. Unlike most of the Fuchsias, this is an evergreen variety, and flowers on the terminal ends of the shoots, much after the manner of that once popular old favourite *F. fulgens*. The leaves of *serratifolia* are of a peculiar metallic glaucous-green hue, a tint that sets off the rich pendulous flowers to great advantage. This variety has probably gone out of favour by being treated in the ordinary way and grown as a summer-blooming plant, at which season it is comparatively worthless, as it seldom shows a flower. Cuttings put in at once will make very useful plants by the autumn, and if kept during winter in a uniform temperature of 45° to 50° they will afford a continuous succession of bloom. In order to induce free growth, the plants should be potted on from time to time as required. The soil best suited for them is a mixture of loam and old spent Mushroom dung, and the plants should either be grown out of doors during summer in partially shaded situations, or in cold frames, where lights can be drawn off. As the corymbs of flowers are borne on the terminal points of the shoots, they should not be stopped later than the end of June or middle of July, or they will not have time to develop fine heads. The habit of the plant is naturally bushy, and it is better to allow it to assume its own natural form than to check and cramp it by stiff and unnatural training.

Linum trigynum.—This is but seldom met with in good condition, and yet, when well grown, it is one of the most useful of winter-blooming plants. There is a scarcity of really good yellow flowers, even in summer; therefore this *Linum* is doubly valuable, as it comes in at a season when gay flowers are most wanted. It should not be treated as an ordinary greenhouse plant; on the contrary, it requires special management to grow and bloom it successfully. It is useless attempting to grow it in a house among other plants, where it is subject to sudden atmospheric changes, as the growth is sure to be slow, and the leaves small and poor; a condition in which they become a prey to red spider. Anyone having an old plant or two of this *Linum* to start with, should at once place them in gentle moist heat, where they will soon afford a sufficient supply of cuttings. These should be taken off as soon as possible, and be inserted in cutting-pots, filled principally with rotten leaves, mixed with a small quantity of sand. Cuttings inserted in decomposed vegetable matter, such as leaf soil or peat, appear to emit roots much more freely than they do in anything

else; and, when rooted, they may be separated without injury. The soil best suited for them is a mixture of loam and peat, two-thirds of the former to one of the latter; but where peat cannot be readily obtained, the same quantity of leaf soil may be substituted. Most kinds of fast-growing plants delight in a loose, rich, porous soil, through which water can percolate freely, and this is of essential importance in growing this *Linum* successfully. After potting, it should be placed in gentle heat, and in a position where it can be kept moist by frequent syringing, or it will be liable to the attacks of red spider. To obviate this, it should be grown in a house or pit by itself, so as to receive the kind of treatment best suited to it. The most suitable place in which to grow it during the summer is a deep pit or frame that will allow room to hold sufficient leaves or old tan in which to plunge the pots; if either of these materials is in a state of gentle fermentation, so as to afford a slight bottom-heat, so much the better. It will be necessary to shade slightly for an hour or two during the hottest part of the day; but the shading should be removed early, and, after watering, the plants should be heavily syringed, so as to wet every leaf thoroughly, both upper and under surfaces; after which they should be shut up close. Treated in this way, they will grow freely, and be clothed with clean healthy foliage down to the pot, provided they are not plunged too thickly. By the end of September they should be placed in a light airy house, and be kept in a temperature of about 50°, in which they will open their flowers freely and continuously during the greater part of the winter.

J. SHEPPARD.

Woolverstone.

Azalea Buds Perishing.—It is a very common mistake for persons to suppose that, if Azaleas push young growth freely in the spring before blooming, it will have the effect of starving the incipient flowers, and thus prevent their opening. It is natural to all Azaleas, when in good strong healthy condition, more or less to make growth in this way, according to the nature of the variety; and, if the buds are plump and well-ripened in the autumn, it will in no way interfere with their flowering, unless in the case of young plants that make excessively lank strong growth. If at any time during the winter, or more particularly in the spring, after the young growth has begun to push, Azaleas are allowed to become dry at the roots, it will kill the buds. They will at no time stand so much drought as most other hard-wooded greenhouse plants—not even when comparatively dormant. Plants in good healthy condition are much more liable to suffer from an insufficiency of water than those having fewer leaves to support. I should recommend that Azaleas making strong growth should be kept warm a little longer in the autumn than the rest of the stock, so as to get their buds up larger and better ripened; as also not to allow the soil, during the winter and spring, to become quite so dry before water is given, as in the case of plants carrying a less quantity of leaves.—T. BAINES.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Sowing Primrose Seed.—In spite of what "A. D." says (see p. 124) I adhere to my advice of sowing Primrose seed as soon as it is ripe. I sowed some taken directly from the plants, about the end of June last in pans and kept it in a greenhouse ever since. Some of the seedlings are going to flower this season, and all are thriving young plants. Thus my method is a year in advance of that of "A. D." A few have already flowered.—FRANK MILES.

Camellia reticulata.—There is a remarkable specimen of this fine old *Camellia* now in bloom at Chiswick House. It was planted by Mr. Charles Edmunds in 1822, and he yet remains in charge of the place to see the plant gradually attaining greater dimensions and producing its numberless blossoms. The flowers are, as is well known, of large size and red marbled with white. It is a grand kind for cutting and is much in request at Marlborough House. The fine *Camellia*-house in the Prince of Wales's garden at Chiswick House is now and has been for many weeks past beautiful with abundance of flowers.—C.

Wintering Caladium Tubers.—A writer in the "Gartenflora" says he has been very successful in preserving his *Caladium* tubers. As soon as the leaves begin to die off in autumn, water is withheld from them, and the pots are left standing thus for two or three weeks, until all the leaves have quite withered away. The tubers are then taken out of the soil and trimmed, and all those of each sort, even if there are a dozen or more, are put together in a pot filled up with sand. The pots are then plunged over the rim into the hotbed of a propagating-house or Pine pit. In this way, the tubers keep as sound as could be wished; and when taken out in February, they already begin to sprout. They are then potted singly, and sunk in a hotbed to make their growth.—H.

Propagating Coprosma Baueriana variegata.—I can corroborate Mr. E. G. Ottewill's remarks on this subject (see p. 336). We put in about 600 cuttings of this *Coprosma* this spring in the way which he describes, and ninety per cent. of them have rooted. The chief points are, to have the plants in heat a few weeks before taking off the cuttings, to give them a brisk bottom-heat when put in, and not to attempt autumn propagation. We lift our plants in October, pot them, and put them in a close frame for a time until they have become established; then we winter them in a cool Peach-house or Vinery. The *Coprosma* will stand a little frost; it shows off its beautiful foliage best in the rainy days of autumn, therefore no one need be afraid of leaving it out until the regular bedding-out season has completely come to a close.—H. J. C., Grimston, Tadcaster.

THE FRUIT GARDEN.

SAUCERS OF SOIL IN STRAWBERRY FORCING.

As auxiliary feeders, saucers, or flats, are absolutely necessary in the pot culture of Strawberries when grown on shelves in hothouses, for the pots are always so crammed with roots, as they should be, that it is not possible with one watering a day to keep the plants supplied with sufficient moisture without the assistance of saucers. I like to keep the plants liberally supplied with water, and when needful with richer food; but frequent interference with them after the fruit is set is objectionable. For this reason I have always disliked using liquid manure, for fear of spilling it over the plants and fruits, thereby causing rust and disfigurement; and this season I have done without it entirely, and the plants have not, apparently missed it in the least. The flats which I use are of the ordinary size, but not for holding water, for I have them made to order with a hole in the bottom of each, and they are filled with light rich soil and put under the plants when they are first introduced into heat. To facilitate rooting through, I see that the crocks in the bottoms of the pots are clear, by chipping the hole a little larger with a piece of pointed iron. The pot is then set on the saucerful of soil, and I always find that the plants at once root into it, the saucer generally being well filled before the plants are in flower. No top-dressing is given, and this season, instead of using liquid manure, I mixed a little of Standen's concentrated bone dust among the soil for the saucers, with the best results. I would strongly recommend saucers of soil instead of saucers of water, which, except in careful hands, are apt to rot the roots. When soil is used the most active feeding roots are all in the saucer, which receives the water that runs through the pot; and it is always moist, even in the driest days, without ever getting sour, while there is no danger whatever, either from excessive drought or excessive moisture. Some may object to saucers of soil, seeing they have to be used from the beginning, otherwise their advantage is partly lost, and consequently prevent the pots being plunged in a bed of leaves at starting time, a practice very generally followed by Strawberry growers. My reply to this is, that I have ceased to believe in the utility of placing Strawberries in bottom-heat at the beginning, and afterwards lifting them out when they come into flower. The first thing which they do under such circumstances is to root through into the leaves; consequently, when the plants are moved these roots are sacrificed, while if they had had a saucer of soil beneath them they would have been saved—and that their assistance tells wonderfully in the end, in the size of the berries and general weight of the crop, I can attest from experience. I find that in about a fortnight, or less, the roots have generally got a good hold of the saucers and have frequently made several coils around them, that they are always exceptionally strong and active, and that the flower scapes are proportionately vigorous, and produce better fruit than they otherwise would have done.

J. S. W.

Peaches and Nectarines on East Walls.—We have two walls here covered with Peaches, Nectarines, and Apricots, one of which is a south wall, while the east wall, which is more than 100 yards in length and 11 feet in height, is entirely devoted to Peaches and Nectarines, but principally Peaches. The trees on both walls have borne well every year during these last five or six years, some seasons heavier than others; but, as a rule, the fruit has always set thickly enough to need thinning. It would, I think, be impossible to say that the trees on one wall were more fruitful than those on the other. As regards the east wall, there is perhaps one slight disadvantage with which we have to contend. I have noticed, especially after a wet autumn, that some parts of the young wood near the ground get cut by frost in winter; a circumstance doubtless owing to the wood being insufficiently ripened. This, however, occurs to so slight an extent that no great harm is done. The trees on the east wall are quite three weeks behind the others in coming into bloom, and from two to three weeks later in ripening their fruit, thus considerably prolonging the Peach season—an important advantage, while the fruit itself is fully equal to that on the south wall in size, colour, and flavour. In order to protect the blossoms, we use 14-inch coping boards, fastened to brackets with small hooks and eyelets, and, suspended from these, is wool netting. As soon as the fruit is fairly set, the coping and netting are removed, the brackets alone being left. At first, when the coping was put up, the boards were nailed permanently to the brackets, but this I found shaded too much of the tree; therefore I had it altered. I may add that from the presence of old Peach labels on the west wall, which is now covered with Plums and Pears, there is no doubt that at one time it was a Peach wall; and more than likely the change was made rather on account of getting fresh soil, than from any desired change in the aspect.—W. ORR, *Stow Hall, Norfolk.*

THE GARDEN IN THE HOUSE.

CHURCH DECORATION IN NEW YORK.

THERE can be no doubt that more cut flowers are used in New York than in any other city; and for church decoration on special occasions, such as Easter and Christmas, flowers are employed by all denominations. For wreaths, crosses, and other designs used at funerals, nothing but white flowers are employed, with the exception of Violets and yellow Rose buds. In a late number of THE GARDEN mention is made of the old-fashioned plan of making crosses on laths and wreaths on a bent stick or wire; the wire shapes, which cost but a trifle, are much better, and are used by all the florists in this country. Such shapes are backed up with tinfoil and filled with wet Moss; the flowers are wired on match sticks, which are sold in bundles of about a foot in length; these are cut to the required lengths. By this plan fewer flowers are consumed than would otherwise be the case, and the devices are made up in much less time than where laths or hoops are employed; and, should any tinfoil be visible, it is in character with the other decorations. The flowers employed at Easter for church decoration consist of white and red Camellias, and white and red Azaleas. Flag of Truce being one of the best of the white kinds, and being double and of good substance, lasts much longer than the single varieties. In addition to these are used Eucharis grandiflora, amazonica, and candida, Richardia æthiopica, Spiræa japonica, Deutzia gracilis, Passiflora princeps, perpetual Carnations, Tea Roses, and Violets. Of Orchids, Dendrobium nobile and Pierardi are often employed; of the latter I have cut shoots a yard in length and covered with flower, to form a wreath for the arm of a cross of flowers 6 feet in height, for a church in Philadelphia, and also for hanging round a lofty vase of flowers in Henry Ward Beecher's church, in Brooklyn. Mixed with Smilax, racemes of Passiflora princeps, and with Polypodium subauriculatum, Chysis bractescens, Angraecum sesquipedale, Cœlogyne cristata, different kinds of Cattleya, Lælia anceps, and Lycaste Skinneri, answer well. The most popular churches appear to use the most flowers, which are generally presented by members of the congregation; when such flowers are done with they are generally distributed among the different hospitals and other charitable institutions, to the inmates of which they prove most acceptable. Late on Saturday night, before Easter, the principal florists in Broadway may be seen busily preparing flowers, in different shapes, for the forthcoming Sunday—one may be found fitting up a 6 foot vase with white flowers, consisting of Camellias, Carnations, and Richardias; others preparing pyramids generally with a white ground and scarlet cross in the centre. In one church were vases full of Richardias and Lilium candidum, and white Azaleas in pots, but the plants were badly grown. In another church I saw a white cross, about 4 feet in height, with a dove above it, and vases of flowers on each side of it, and in the font was a large pyramid of flowers; in another, in addition to the cross and pyramid in the font, were baskets of flowers, chiefly Roses, on the communion table, and the chancel angles were filled with light foliage, such as that of Papyrus, among which were placed Lilies and Richardias. This was the lightest and most tasteful decoration I met with. These decorations for the most part looked too heavy, owing to the lavish way in which flowers were used without any relief from foliage. Easter Sunday was the third day of spring weather which we experienced after a long and severe winter; and, the snow was still a foot deep in gardens on the shady sides of the higher-lying streets; the sun shone brightly all day, and the air was moderately warm; in fact, seats in the squares were occupied by people without chance of being frozen to death, a calamity to which we have been liable for some months past; and, although the ice had not melted around the paddles of the ferry steamers, the rivers around the city were free from ice; but teams were still crossing the Hudson on the ice at Albany on the 2nd of April. JAMES TAPLIN.

South Amboy, New Jersey, U.S.A.

Small Vases for Flowers.—Charming arrangements of flowers can be made at this season with but few blooms and those not of expensive varieties. A few days since I arranged two little vases, or rather specimen-glasses, with the following:—In each I placed a single bloom of a double variety of white Azalea, some sprays of Deutzia gracilis, and three white Cyclamens, the whole being backed by a frond of Pteris tremula; two smaller fronds of this Fern were also placed in front, and bent down so as to droop gracefully. These little vases were arranged to match, and were for placing on a side table in the drawing-room. Many pretty floral groups can be effected with but few flowers if a little time and taste be employed in their arrangement. The Dielytra is a flower now coming into the market, and is well

adapted for the decoration of both large and small vases, as sprays can be obtained and cut off this plant of almost any size. This flower has the advantage, too, of being equally effective by either day or artificial light. As a hardy plant the *Pyracantha* is very useful for cut purposes; a spray of it, when placed amongst white flowers, such as Lily of the Valley, Deutzias, &c., with the addition of a little Fern, being extremely effective.—A. HASSARD.

The Night-scented Stock.—Amongst night-flowering and night-scented plants this is one of the best. Its flowers being of a dull colour, would probably be passed by unnoticed were it not for the delicious perfume which they emit as soon as the sun goes down, and which claim for them a place in balcony and window gardens, where their value is soon recognised. Plants with either scented leaves or flowers are great favourites here, but the prevailing fashion of adorning gardens, as if sight were the only sense to be appealed to, has driven out of cultivation many plants that once were held in high esteem; their unobtrusive hues would be lost amongst the glaring clouds of scarlet Geraniums and similar showy plants, whilst the foliage of many does not adapt them for the sub-tropical department. In balcony and window-boxes and borders, however, such plants are at home, and their fragrance is always welcome as it steals through the open window on the morning breeze or in the calm of a summer's evening. The Heliotrope, Stock, Balm of Gilead, Mignonette, Musk, *Aloysia citriodora*, and scented-leaf Geraniums are all thoroughly adapted for purposes such as these. It strikes freely by means of cuttings, and only requires the protection of a cold house or pit in winter. It will succeed in any good light soil, and will flower in great abundance with a small amount of attention.—JAMES GROOM, *Henham Hall*.

Flowers for the Sick.—A paragraph in the "Times" a few weeks ago, appealing for presents of flowers for the Home of Industry, Spitalfields, and Mildmay Park, seems to have given some benevolent people the excellent idea of collecting spring and other flowers, and sending them to the hospitals for the patients. Children are employed in their playtime by the Flower Mission to gather flowers in woods, fields, or gardens, as the case may be, and then the vicar of the parish sends them in hampers to the hospitals. Guy's has been the fortunate recipient of several hampers of flowers during the week, and the Home of Industry has sent one hundred bouquets, in flower-holders, tastefully surrounded by appropriate texts for the patients. If the clergy will take the matter up in earnest, the Flower Mission will be the means of cheering many a poor sufferer, and we hope all who have flowers to spare will send them to some one or more of the London hospitals. We assure our readers that a ward at Guy's, after the arrival of one of these hampers of flowers, was indeed a pleasant and cheering sight. The poor patients seemed to take a new lease of life from the freshness of the flowers, and bright, happy, contented, faces were to be seen on all sides after their advent. Will anybody, says the "British Medical Journal," refuse to aid the Flower Mission, or deny these poor sufferers, so cheaply purchased and yet so inestimably valued, a pleasure as a bunch of fresh, sweet, radiant flowers?

Latakia Tobacco.—The best Latakia Tobacco is cultivated in the districts of Diryoos and the Amamarah, situated in the most northern and elevated parts of the Ansariyeh Mountains nearest to Latakia, in Syria. Great care is bestowed upon its cultivation by the mountaineers, who, up to a short time ago, depended upon it for their chief support. The Tobacco harvest is in October in the mountains and earlier in the lower ranges. The leaves are gathered and strung upon strings of goat's hair, then left to dry in the shade, when they are hung to the rafters of the houses for fumigation or otherwise, and left thus till the tax-gatherer comes, when they are sold in loads of 100 or 150 strings. The best kind of Tobacco is known by the name of "abow riah," or father of scent, and of which a small quantity only is cultivated. That raised in the lower mountains is less valuable, and is called "skek el bent." The plant is the species called *Nicotiana rustica*, like that raised in China and most of Asia, and of which the leaves are shorter and broader than the *Nicotiana Tabacum*, or Virginian Tobacco. It has a most pleasant perfume, and, like the Havannah cigars, possesses probably but 2 per cent. of the poisonous volatile alkali called nicotine; whereas the Virginian Tobacco contains nearly 7 per cent. The greater part goes to Egypt and Turkey, and a small quantity to England. The cultivation of Latakia Tobacco has, in common with that of other Syrian varieties, lately received a severe check by the imposition of an import duty upon its entry into Egypt, and also by the establishment of the "Regie." The peasantry are relinquishing the cultivation of this article, and prefer sowing cereals in its place rather than continue its production under the adverse circumstances which now attend it.

GARDEN SONGSTERS.

FOR those who thoroughly enjoy the flower beauty of gay gardens and the shaded mystery of woods, many other closely associated charms possess nearly as great an interest as the aspects of the trees and flowers themselves. For instance; in early spring there are those charmingly fitful lights and shadows of gleamy April, and the murmur of brooklets swollen by its timely showers, and there are the gentle rustling sounds of the young fresh-budded branches as they are swayed by the spring breeze. But, above all, there is the song of birds of many kinds that fills the air with "gentle jargonings," as Coleridge so deftly named the bird concerts of our gardens, woods, and orchards—gentle jargonings, which must charm and soothe even those who do not notice (or think they do not notice) the harmonies that echo sweetly among the branches. We have had the merry twittering song of the wren, and the louder and more varied wild notes of the robin throughout the whole winter whenever an early gleam of sunshine or a mild still morning tempted them to warble forth their melodious matins; and then, in March, the light low refrains of other garden warblers commence, such as those of the Willow wren, a little innocent slaughtered remorselessly by gardeners as a pest, and deemed so on the authority of the amiable Gilbert White, who was, for once, mistaken, for the Willow wren is one of the gardener's best friends, being a most industrious destroyer of insects, more especially of aphides, as soon as they appear. The short but cheerful song of the chaffinch comes next, and never seems to weary the true lover of bird music, even by its incessant repetition, which seems to come like a pleasant and necessary refrain in the pauses of the concert. The short songs of many other little warblers then begin to play their part, while the continual twitter of others forms a running accompaniment that scarcely ceases till mid-day, to recommence, though with less briskness, towards sunset. Above the gentle din rise the wild wood-notes of the rich-voiced thrush, who sings out his delightful succession of detached notes or passages with a confidence and sweetness that induce many connoisseurs of the woodland opera to place him foremost among our native songsters. His rival, the blackbird, twirls out his quaint and resonant notes with equal power, and almost equal skill—he is the buffo of the woods. Instead of slaughtering these pretty vocalists, under pretence of their being more or less destructive to garden crops—and it must be admitted that the blackbird is very fond of Cherries—how much more interesting than the miserly saving of a little fruit that we can very well spare, would be the study of the sweet, wild music of these pretty singing birds. To be able to name each bird, even when unseen, by his song alone, is a pleasure none can know who have not tasted of it. Those, for instance, who go to the Italian Opera, ignorant of the names and characters of the singers, of the language in which they sing, and of the composers whose genius produce the music, enjoy but a vague and unsatisfactory impression of the performance. So in our woods, and gardens, and orchards, the enjoyment of the vernal bird-music is in corresponding proportion to our knowledge of the birds, their habits and their songs. In the foregoing list of tuneful songsters, the very greatest, and some holding brilliant places in the second rank, have not yet been referred to. The softly beautiful notes of the woodlark, sweet and low, have to an extent that none but "woodlark fanciers" can ever know or feel, their own peculiar charm; in comparison with which those of the soaring skylark, who only sings aloft, are, to a certain extent, noisy and coarse. There is the black-cap, too, whose notes, though less florid and varied, are almost as rich as those of the nightingale, and are sometimes mistaken for them; but when the nightingale himself arrives, generally about the 12th or 14th of April, all other bird-music is cast into the shade. His notes are more varied, more beautiful, more powerful, more brilliant, and present greater contrasts to each other than those of any other singing bird. Soft passages, that simulate the bubbling of running water through a narrow channel, are rapidly followed by others, sometimes repeated twenty or more times, brilliant and sonorous as trumpets sounding a victory. This is followed by trills of gradually rising brilliancy towards a glorious burst; and then a plaintive series of moaning sounds



HAPPY SECURITY.

succeed, rising in semitones, and culminating in an outburst of joy or grief, which leaves all other bird utterances far behind. Another series of the nightingale's notes comprises a succession of delicate hair-drawn sounds, finer and finer still, till they are like threads of glass, breaking at last into a brilliant cadence that I will not attempt to describe, because it is indescribable. Let every one who loves gardens, and with them one of their chief attractions, the music of our singing birds, study the song and the history of the nightingale; and the more they know of his habits, as well as of the details of his song, the more they will appreciate his annual spring visit—that is to say, if they have the luck to be located in a nightingale district, the distribution of his favours being exceedingly capricious; beautiful Devonshire being “out of his beat,” while tolerably bleak parts of Yorkshire are honoured by an annual attendance. Among things to be unlearned about the nightingale is much of the teaching of the poet, by whom it was thought that the glorious song was that of the female—the nightingale, as a song bird, being continually apostrophised as “she.” Another error to be got rid of is, the supposition that the nightingale only sings at night, while, in point of fact, the period of his most brilliant and lavish song is the brightest part of the spring day, from eight or nine till eleven in the morning. That he also sings at night, when the night is warm and still, and when there is a rising moon we all know, because he is so plainly heard in the calm silence, when no other bird is singing, but, even then, it is rather an evening song continued into the night, than, strictly speaking, a night song, for he never, except under some accidental excitement, sings in utter darkness. Enough has been said to show how much the enjoyment of a garden may be enhanced by cultivating a knowledge of our singing birds.

H. N. H.

Tea Culture in Italy.—I have just read a notice in THE GARDEN (see p. 336), that the Italian Government intends to introduce the cultivation of Tea into Sicily. It may interest some of your readers to hear of the attempts that are being made to cultivate it in Italy. A gentleman, who has extensive Tea plantations in the Himalayas, felt sure he could succeed with it in Italy, and, in the winter of 1873-74, imported a large quantity of Assam Tea-seed, part of which was sown near Viterbo, in February, 1874, and the young crop seems to be flourishing. The rest of the seed was given to me; but, unfortunately, did not reach me until towards the end of March, 1874, when the essential oil of the seed had undergone a considerable change, and the seeds seemed worthless. However, a few of them came up; they take about six months to germinate. My place is about 1,000 feet above the sea. The plants were small. When the cold weather set in, they stood the frosts of this exceptional winter, but were cut over by a bitter wind in January; they are now, however, shooting up from the roots. Among Teas, the Assam is the most delicate, and I do not think it will answer at this height. The same gentleman imported this last winter some of the Hybrid Tea-seed from the Himalayas—a cross between the Assam and the China. A large bag of it reached me in good condition; it is much hardier than the Assam. It was sown in February, and, I hope, may be a success.—FRANCIS NEVILLE REID, *Ravello, near Amalfi, South Italy.*

The Sycamore Tree.—In an interesting work on Palestine, written in French by Solomon Munk, occurs the following passage:—“The wild Fig trees or Sycamores were found in great numbers in the plain called Schefela. The Sycamore has a very strong trunk, and its horizontal branches, always green, extend afar. Its leaves are similar to those of the Mulberry; its fruit, which resembles Figs, has an insipid and not particularly agreeable taste. The wood, though light, is very durable; the Hebrews employed it in their buildings. The coffins of the Egyptian mummies were made of Sycamore wood, and have been preserved down to our own day. Ritter, quoting Clarke, mentions pictures on Sycamore wood found at the church of St. Anna at Siphori, in Galilee, and sent to Cambridge. These pictures, which are much older than the tenth century, are in good preservation, and are not worm-eaten. The Sycamore tree, from its vigorous nature, its branches so magnificently developed, and its perpetual verdure, is an exceedingly agreeable and convenient place of rendezvous. The Orientals climb up among the branches, as Zaccheus is said to have done. There they seat themselves, to smoke and chat. At present this tree appears to be growing rare in Palestine. Hasselquest did not see it, except on the coast near Jaffa.”

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Sowing Scarlet Runners, French Beans, Kale, Peas, &c.—A full crop of Scarlet Runners should now be sown. It does not do to let any considerable length of time elapse between this and the sowing already advised, as, if the first happens to suffer through frost, those now planted will succeed them without any loss of time. At the same time, put in some more Dwarf Beans. Green Curled and Cottagers' Kale should now be sown; these will come in for planting upon ground vacant from the early crops of Potatoes, Peas, &c. The Cottagers' Kale should be grown in every garden, large or small; it is as far superior to any other variety of the Kale tribe as a spring Cauliflower is to winter Broccoli. The seed is generally mixed; some of the plants coming up quite green, whilst others are tinged with purple. These latter only should be planted, as, both in flavour and texture, they are much superior to the green, and but little inferior to Brussels Sprouts. Go over the early sowings of Cauliflowers, Broccoli, Cabbages, and Brussels Sprouts. Remove all weeds from amongst them, and thin out the plants to about 4 inches apart every way. When these are allowed to remain crowded together, they get so weak and drawn that when planted out they are throughout the season behind such as have had sufficient room in the seed-bed; and, in the case of Brussels Sprouts, they never produce so good a crop. The plants that are thinned out may, if required, be planted out in a nursery-bed, where they should be 6 inches apart; at which distance they may stand for some time, and can be finally planted out later on, as more ground is cleared of other crops. Sow more Peas as succession crops, and also more Spinach upon any vacant spot.

Preparing Ground for Spring-sown Cabbages, Brussels Sprouts, &c.—Prepare the ground by digging it well, and by giving it a good dressing of manure for planting with the spring-sown Cabbages of different sorts and Brussels Sprouts, as it is important to get these in as soon as they are large enough to plant; especially the Brussels Sprouts, which become larger, and the produce is proportionately greater—if planted early. The ground for Celery should also be prepared at the present time. It is much better to have this in readiness before the time for planting has arrived, as it should be put in during showery weather if possible, which can be taken advantage of without delay when the ground has been made ready beforehand. The usual way of planting is in trenches, with from one to three rows in each. For the earliest, the three row system causes a saving of ground; but it is not suitable for withstanding the cold of winter, being more difficult to protect, more exposed to wet, and consequently more liable to rot. In wet heavy land, for winter crops, single rows are best; in such as is dry and tolerably light, two rows in a trench may be grown. Upon the number of rows it is intended to grow together will depend the width of the trenches. If three rows are planted the trench should be 4 feet 6 inches in width; for two rows a 3 feet trench is necessary; and, for a single row, one of 2 feet wide will suffice. The space between each trench will require to be proportionate to the width of the trench, so as to afford soil sufficient for earthing up, without coming so near the plants as to injure their roots—a mishap that often occurs in Celery growing. It is of importance to keep this in view, especially for the late or principal crop. Single rows, to stand through the winter, should have a space of 2½ feet between each trench, or, if 3 feet, all the better. For double rows allow 3½ feet between them; where three rows are to be planted 4 feet 6 inches will not be too much for them. In each case the trench should be formed by removing about 9 inches of the soil to the width required, and laying it up between each trench in the usual ridges. Then put in each trench 6 inches of good manure—such as has become thoroughly rotten is by many considered indispensable; but that which is half rotten is equally good, provided it does not contain too much straw. For dry light land, a mixture from the stables and cowshed is the best; the latter, being cooler, keeps the plants growing better in hot dry weather. Dig the manure in with 10 inches of the bottom soil of the trench, or a little more if there be sufficient depth without reaching that which is bad and unsuitable, and thoroughly incorporate the dung with the soil. Ground so prepared, some time beforehand, so as to get soaked with rain, is in a much better condition for planting than if only made ready immediately before the plants are put in. The ridges between the trenches, especially where double rows of Celery are grown, will answer for a row of Lettuce, which will be cleared off before the Celery requires earthing up. For this purpose, the middle of the ridges should be hollowed a little so as to hold the water which the Lettuce will need in dry weather; and here also manure-water will be of use, as the ridges cannot well be manured for the Lettuce.

Water Supply.—The greatest want in very many gardens is an adequate supply of water, especially in the kitchen garden, the

nature of the crops requiring very much moisture. This is more seriously felt on dry soils, yet it frequently happens that, at comparatively little cost, a copious supply might be drawn from higher ground; in which case it can frequently be made available, in the least costly manner as regards labour, by the use of a hose pipe and tap turned on amongst the growing crops. Where there is a considerable extent of vegetable ground, and where the walls are covered with Peaches and Nectarines—that must be plentifully watered, both overhead and at the roots—pumping is slow work, to say nothing of the frequent unsuitableness of water so obtained for application to any growing plant. Again, the means of conveying water from wells and tanks to the different crops is often not the best. The ordinary water-barrows sold by the general makers are the very worst used—mounted on miserably low wheels, they require three times the force to drag them that would suffice were they properly constructed and of a reasonable height. There is also very often deception as to the size, whether they be made of wood or galvanised iron. Such as are advertised to hold thirty gallons or so will generally, when measured, be found full when they contain eighteen or twenty. Where, as is the case in most gardens, large or small, the water has to be applied by hand, there is nothing that effects a greater saving in labour than a good water-barrow; the wheels should be 4 feet high, with a crank axle under the body of the barrow, which should be made of strong galvanised iron rivetted, made with a good large spout, and hung so as to enable the load being easily tipped over. It should hold from sixty to seventy gallons, with a handle in front fixed in the usual way to the irons that stand upright from the axle and on which the body is hung. Such a barrow, if properly constructed, and the wheels made to run easily, can be moved about on anything like level ground by one man, and with much greater ease than the low-wheeled inventions that will not hold one-third of the quantity. Those who have the good fortune to garden on deep alluvial soil with a cool bottom, or on moisture-holding peaty land, may think themselves well off in a dry season, but in far the greater number of gardens, even where everything possible in the shape of deep cultivation, liberal manuring, as well as mulching, is carried out, if water is not used freely, the crops will be small in quantity, and equally wanting in quality; but, where water is used without stint, the produce resulting from it amply repays the cost. One of the first considerations I should urge upon all amateurs who prefer an abundant supply of good, tender, wholesome vegetables to the tough, fibrous produce of dry, hardened soil, is to provide the best means for applying water.

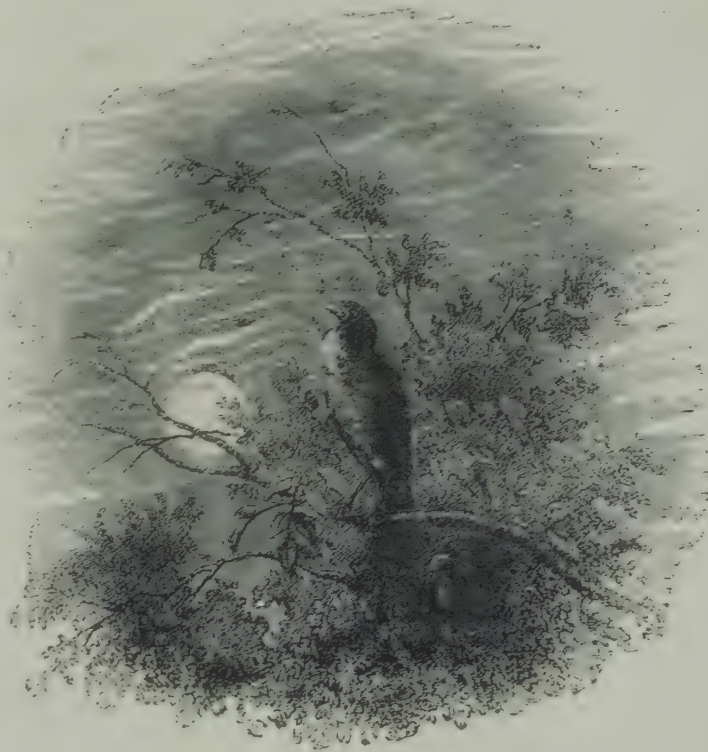
Pits and Frames.—Melon-plants raised some time back should now be ready for planting out, for they should not be allowed to remain too long in the pots, where they are liable to be stunted. See that at first the bed is not too hot, or the roots may be burnt. Before the soil is put in, the old method of placing a sod 3 or 4 inches thick and about 2 feet square (with the Grassy side downwards) upon the bed, right under each of the small hills of soil in which the plants are to be put out, is a safe one to follow. This, unless the bed is much too hot, will prevent burning, and with a large bed is always an advisable precaution; for, even when the heat in the bed before it is soiled has subsided to 80° or so, a change to warm, mild weather will sometimes cause it to rise so as to injure the roots, if not prevented.

Peaches and Nectarines on Walls.—The fruit will now be set, and whatever protecting material has been used should be removed; but, where a moveable coping exists, this had better remain a little longer for fear of frost. A good washing with the syringe or garden-engine will be beneficial to them. Greenfly, which in most cases rarely fails to make its appearance, should be diligently sought for, not allowing more than two or three days to elapse without inspection. If they are allowed to get much hold of the young leaves, they quickly injure them, and are, in addition, much more difficult to destroy. They generally appear near the bottom of the trees first, and may easily be detected by their causing the leaves to curl up. When found, even in small numbers, syringe the infected

part with tobacco-water, not allowing a single leaf on which they exist to escape, or it will necessitate a repetition of the work.

Houses.—Vines that were started slowly at the end of February will, if all has gone on well with them, have set their fruit, and soon require thinning. The most approved practice with Grape growers is not to syringe at all after blooming, or only once, to remove the dead flowers; but with amateurs, especially those who have not had much experience with Vines, the case is somewhat different, and, if the syringe is not used, the probabilities are that the Vines will get over-run with red spider; and, although the use of the syringe has the effect of destroying the bloom, which undoubtedly adds so much to the appearance of the berries when ripe, nevertheless I should advise amateur Grape-growers to use the syringe daily until the fruit begins to colour. Syringe early in the afternoon, and close the house at the same time, whilst there is yet sun upon the glass. As to thinning the fruit, this should be attended to as soon as the berries get as large as small Peas; if they are allowed to attain a considerable size, it is so much taken out of the Vines for no purpose, and the work is much more difficult to perform. The quantity of fruit to be left should in all cases be determined by the strength and condition of the Vines; nothing can be worse than over-cropping; but no practice is more common. Bad as it is in the case of established Vines, it is worse with young ones. Vines that have been over-cropped whilst young seldom, if ever, gain their perfect strength, no matter

how well they may be subsequently treated. The size of the bunches should regulate their number; the powers of any Vine that is allowed to mature a dozen bunches of 2 lbs. each being quite as much taxed by their production as those of another Vine would be in ripening double the number of only half the weight. A stout Vine with a rod the length of an ordinary rafter, say 18 feet, will bear from 20 lbs. to 24 lbs. of Grapes, without being over-taxed; and, unless in exceptional cases, this is enough. In the case of open-air fruits, where they so often fail through adverse seasons, we are frequently tempted, when there is a chance, to take a much heavier crop than would be allowed to remain, could we depend upon having a reasonable quantity every year; but Vines under glass are subject to no such influences, and should never be taxed beyond what their strength can support without deterioration.



A Garden Songster (p. 369).

A Cottage Garden.—If I have no coaches and horses, I can at least hang a tracery of living leaves along my porch, so exquisitely

delicate that no sculpture can match it; if I have no conservatories with their wonders, yet the sun and I together can build up a tangled coppice of blooming things in my garden of which every tiny leaflet shall be a miracle. Nay, I may make my home, however small it may be, so complete in its simplicity, so fitted to its offices, so governed by neatness, so embowered by wealth of leaves and flowers, that no riches in the world can add to it without damaging its rural grace; and my gardeners—sunshine, frost, and flowers are their names—shall work for me with no crusty reluctance, but with an abandon and zeal that ask only gratitude for pay.—D. G. MITCHELL.

Flower Shows a Hundred Years ago.—In an article recently published in "Chambers's Journal," are the following advertisements on this subject, taken from the Ipswich journals of the years 1745, 1746, 1747, and 1748:—"This is to give notice that the annual show of Auriculas will be at the house of Mr. John Wards, at the White Lion, at Hadleigh, on Friday, the 27th instant, when all lovers of these pleasing productions of Nature will meet a hearty welcome and a kind reception from their humble servants—Peter Norman, Jacob Price, stewards." "On August 2, 1746. 'The sons of Flora will hold their annual feast at the Maid's Head, in St. Simon's, Norwich, on Wednesday, the 6th day of August next, when all gentlemen, who are admirers of the beauties of Nature, are desired to come and view the greatest number of new and well-blown Carnations that the year produces.'"

TREES AND SHRUBS.

MR. EDWIN LEES ON THE GLASTONBURY, OR "HOLY THORN."

THIS is considered by a writer in "Science Gossip" to be "a miraculous Thorn tree;" and as such it was no doubt represented by the monks of Glastonbury Abbey; for almost every monastery possessed some object intended to excite popular wonderment and veneration. The flowering twice a year, for which this Thorn is remarkable, is, however, a not very uncommon circumstance; for I have noticed it in the Eder, Dogwood, and other shrubs. Such a circumstance takes place every year among Apple and Pear Trees, and may be seen recorded in local newspapers as frequently as the stereotyped "big Gooseberry." The curious circumstance as to the Glastonbury Thorn was, that its second crop of flowers occurred so late in the year that they could be accredited to Christmas Eve. But it must be observed that when the style was altered by Act of Parliament, and eleven days omitted to correct the Calendar, the "Holy Thorn" did not recognise this alteration, and would not show expanded flowers until Old Christmas Day. This was some years since put to the test in Herefordshire, where there were, and still are, several "Holy Thorns;" and so determined were the inhabitants of the rural parishes to trust to the flowering of the Thorn rather than to the Calendar, that the clergymen of many country places felt obliged to hold services in their churches on Old Christmas Day. I have in various years received branches from "Holy Thorns," in January, having mostly unexpanded flowers that soon wither, and no fruit is produced from these secondary flowers. It is generally asserted that all these Christmas-flowering Thorns are the product of the original Glastonbury Thorn, which was destroyed by Puritanical hands during the civil commotions in Charles the First's time; but this I think very dubious. Quaint old Aubrey, in his "Natural Remarques in the County of Wilts" (1685), states that "in Parham Parke, in Suffolke (Mr. Boutele's), is a pretty ancient Thorne that blossoms like that at Glastonbury; the people flock thither to see it on Christmas Day." Aubrey further says that he was informed by Dr. Ezerel Tony, "that about Runnymarsh (Romney), in Kent, are Thornes naturally like that at Glastonbury." He mentions also that, "in the rode that leads from Worcester to Droitwiche, is a Blackthorn hedge at Clayn, half-a-mile long or more, that blossoms about Christmas Day, for a week or more together." This second flowering of trees and shrubs must, then, be considered a natural development, under special circumstances, which may or may not be continued, and certainly cannot be ensured to appear on a particular day, though often doing so, or near enough to the time for the credulous. The real Miracle, as affirmed by the monks of Glastonbury, was, that Joseph of Arimathea, after landing in Britain, paused upon Wearyall Hill, near Glastonbury, and planted his staff in the ground, whence sprung the wonderful Thorn that flowered every year at Christmas. That the tree really did arise from a Thorn staff stuck in the ground by some pious hand, if not the Scriptural Joseph, is not improbable; and this fact, noticed by the abbatial ecclesiastics, was a good thing to convert into the miraculous, while the double-flowering was luckily superadded. Hawthorn sticks will, in fact, vegetate, like Willow-branches; and Sir Thomas Dick Lauder, in his edition of Gilpin's "Forest Scenery," mentions the case of a Hawthorn stake, taken from a dead hedge, which, having one end sharpened and stuck in the ground, "spontaneously budded, put forth branches, and became a thriving tree." So I myself, some time since, brought home a tall denuded Hawthorn stick that I had picked up, which was stuck in the mould of the garden to prop up some plants; and this has rooted, put forth branches, and is now a flourishing tree of considerable height. It flowered abundantly last year; but, as yet, has produced no secondary inflorescence.

Green Hill Summit, Worcester.

EDWIN LEES, F.L.S.

Stuartia pentagynia.—This noble shrub is common in the mountains of Virginia and southward, and although long known as hardy in most of the Northern States, it is seldom seen in gardens. If a common name was wanted for this shrub, "Shell Flower" would be quite appropriate; for the half-opened buds resemble some of the two-valved shells with jagged edges, like the common scallops. The flowers are white, slightly tinged with cream-colour, the ends of the broad petals being scalloped, or what is termed jagged-edged. This species is a very sturdy shrub, 5 to 10 feet high, and when given plenty of room will be well furnished with branches from the ground upward. Its general habit of growth is to produce only a single stem, few or no suckers appearing from lateral roots. A specimen of this shrub planted ten years ago in my grounds has never been injured by cold, even during our severest winters, when

many of the kinds from a more northern climate have suffered severely.

Lindera Benzoin, also known by many other names, such as Spicebush, Wild Allspice, Feverbush, Benjaminbush, &c., is an interesting plant for the gardens of those who like a variety of shrubs. It belongs, however, to the Laurel family, although had it been an evergreen shrub this name would have no doubt been given it, as we have at least a dozen American shrubs called Laurels, not one of which is allied to the true Laurel. But our Lindera is a pretty shrub, growing 6 to 10 feet high, with large, dark green, obovate, oblong leaves 3 to 5 inches long. The flowers are quite small, yellow, and produced in spring, succeeded with bright red, oval berries, which are always ornamental. The leaves, bark, and wood emit an agreeable spicy odour when handled. It is a handsome, easily-cultivated shrub, seldom seen in gardens, although very abundant in the swamps of North America.

Clethra alnifolia, or Alder-leaved Clethra, is a beautiful late-blooming shrub, with spikes of small, white, fragrant flowers. In habit it is rather a slender shrub of 5 to 8 feet high, with few branches but numerous stems opening from the same root or stool, thereby forming a dense clump. It thrives in almost any soil or situation, and is as readily and safely transplanted as a Currant bush.

Andromeda Mariana, or as more commonly called, Staggers-bush, is a beautiful low-growing shrub, with deciduous leaves dropping late in autumn. It is very abundant in the Eastern States of North America in low grounds and thickets, where the plants are usually of quite slender growth and 3 or 4 feet high; but the habit is much improved when it grows singly in a garden. The leaves appear early in spring, and are of a light, glossy green, oval or oblong in form. The flowers appear a few weeks later in the season; they are pure white, a half inch or more in length, and of a tubular form, like the true Heaths, a family of plants to which all of our Andromedas belong.

Andromeda floribunda for House Decoration.—The flower-spikes of this plant are produced during the previous season, and the buds only wait for a few warm days to make them open. A branch cut off in winter, carried into a warm room, and the lower end placed in water, will soon unfold its flowers, giving one a handsome winter bouquet from the garden. We have some half-a-dozen or more species of the Andromedas which may be treated in a similar manner for producing flowers in winter.

Dirca palustris, or Leatherwood, is probably well known to every boy in the Northern border States, as its tough leathery bark is a natural source from whence good, tough strings can always be obtained when other depositories fail. But I am inclined to think few boys who have gathered Leatherwood bark for strings could tell after they became men the colour of the flowers or fruit of this shrub. Neither, however, are very showy or handsome, the former being small, of a pale yellow colour, produced in early spring before the leaves appear, succeeded by a reddish berry ripening late in summer. It is also rather a straggling-growing shrub, 5 or 6 feet high; but it is the only North American representative of the Daphne family.—Correspondent "Moore's Rural."

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The Redwood as Game Covert.—It is not well known that this noble Californian Conifer makes a valuable covert tree in Ireland, especially in sea-shore districts. It also forms good hedges at Bournemouth, and grows as much in one year as the Yew does in five.—JOHN BAIN.

White Camellias Out-of-doors.—There is now in bloom a fine double white Camellia in the garden of Dr. Chater, Tenby, from which eighty flowers have been cut this spring, and about forty still remain on the tree. The plant is about thirty years old, has never been under glass, and is growing vigorously in the open garden.—L.

Increasing the Redwood.—This tree is easily increased by means of cuttings. I have found that in making alterations, pieces of it cut off and stuck in as pegs strike root. One of the best trees in the College Botanic Gardens at Dublin was originally put in by a workman as a stake for a plant.—JOHN BAIN.

Yew not Poisonous to Deer.—It is generally imagined, and by clever observers too, that our sheep and goats eat Yew leaves with impunity. An old keeper in North Wales told me that the deer in P—— Park were very fond of browsing on the Yew trees that grew there; and that he had never met with an instance of Yew poisoning amongst them.—H. G. WATNEY.

Ivy on Beech Trees.—Allow me to inform "Salmoniceps" (see p. 311) that in the private grounds at Hackwood Park, near Basingstoke, there are (or were two-and-a-half years ago) several large Beeches with the main trunks and branches completely enveloped in Ivy to a height of quite 80 feet or more. Many of the trunks of these trees are 12 feet and upwards in circumference—with perhaps not a branch for 35 or 40 feet. Some few years ago, in the case of some of these trees, a quantity of Ivy was cut off, the stems of which near the ground were as thick as a man's leg. I have seen nearly a cart load of rubbish at the foot of the tree when the Ivy decayed and fell off.—H. J. C., Grimston Park, Tadcaster.

THE LIBRARY.

THE NARCISSUS: ITS HISTORY AND CULTURE.*

It must be pleasing to all lovers of hardy plants to see the various evidences of their growing popularity, among which must be included this valuable book. A dozen years ago very few grew or cared about these beautiful plants, and probably no publisher would have been found for a book on Daffodils; now we have most extensive collections of them, and amateurs will find all the information they require in this work. The plates, most of which are drawn from the life from plants in Mr. Barr's rich collection, are by Mr. Burbidge, who has executed them with great care and fidelity to nature. They represent all the species at present in cultivation in this country. A few plates of autumn-blooming species, one or two kinds not yet in cultivation having been taken from authentic dried specimens or drawings. Cultural and historical details are given. Mr. Baker's valuable review of the genus is reprinted, and a list is added of books and articles in periodicals treating of the Narcissus. The following extract concerning *Narcissus gracilis* will give an idea of the style of the work:

This is a very graceful plant, by no means common in gardens, although its grace, beauty, and grateful fragrance ought to make it



Narcissus calathinus.

a great favourite with amateur cultivators. The plant grows from a foot to nearly 2 feet in height, and generally flowers in May, or about the same time as the Poet's Narcissus, and bears from one to three flowered scapes, the latter being bright green, shining, and either cylindrical or slightly two-edged. In form and size the individual flowers are very similar to those of *N. poeticus*, but the whole flower is of a deep, clear, golden colour, changing to sulphur as the flower fades. The corona is cup-shaped or slightly campanulate, and a little plaited or crumpled around its margin. It is undoubtedly very nearly related to *N. poeticus*, and, as has already been suggested, may possibly be the result of a cross between the last-named species, or *N. biflorus* and one of the large-flowered Tazettas. The leaves, however, are very different to those of any of the supposed parents, and closely resemble those of *N. odorus*, or *N. Jonquilla*, both of which are very fragrant, and have yellow flowers, and it is not an improbable idea that it may have been raised between one of these and *N. poeticus* or its congener *N. biflorus*. The fact of its not being found in a wild state goes a long way in support of its being a garden hybrid. It is

* "The Narcissus: its History and Culture," with coloured plates and descriptions of all known species and principal varieties. By F. W. Burbidge. To which is added, by kind permission, a "Scientific Review of the Entire Genus." By J. G. Baker, F.L.S., of the Royal Herbarium, Kew. London: L. Reeve & Co., 5, Henrietta Street, Covent Garden.

one of the most deliciously fragrant species in the whole group, and its flowers are valuable for cutting, as they endure for fully a fortnight in a vase of pure water.—*N. tenuior* (the Slender Sulphur Narcissus) is a distinct and dwarf-growing form of the last, and is well figured in the "Botanical Magazine" (Curtis) t. 373. The bulbs are about the size of thrushes' eggs, and of a glistening greyish colour, not dark brown as in most of the other species and varieties. This peculiarity is well represented in the above named plate. It bears three or four leaves to a bulb, these being from 3 to 5 inches in length, rather slender, and of a dark shining green colour. The scape rarely exceeds a foot in height, and is generally two-flowered. The individual flowers are rather smaller than those of *N. gracilis* proper, being rarely more than an inch to an inch and a-quarter across. In colour they vary from lemon-yellow to nearly pure white, with a lemon-coloured cup. The figure in the "Botanical Magazine" was published in 1794, when the plant flowered in the garden of Mr. John Maddock at Walworth, who obtained bulbs of it from Holland under the name of *Narcissus flore Sulphureus Juncifolius*, and Curtis adds that it "appears to have been grown by the Dutch florists," and is "often double" in gardens. The last-mentioned double-flowered form is still one of the things hoped for amongst amateurs, and is probably lost to cultivation, unless like many other old-fashioned flowers it lingers still in some ancient country garden, unseen by our lynx-eyed modern florists. *N. gracilis* grows well in a warm richly-manured border, and when seen growing is easily distinguishable from *N. tenuior*, which is only about half the height of its congener, and blooms fully a month earlier under the same treatment. My specimens of *N. gracilis* were sent me by Mr. Harpur Crewe, and both white and lemon-tinted forms of the *N. tenuior* variety came from Mr. Barr's collection, in which I had an opportunity of seeing the plants in flower.

There are forty-eight plates in all, most of them replete with details which will greatly assist the student in determining his species. The colouring is not all that could be desired; but in all other respects the book is one we can heartily recommend. The figure above given is that of the rare and beautiful *Narcissus calathinus*. W. R.

Uses of Surface-stirring.—1. It destroys the weeds, which exhale the moisture of the soil with great rapidity. By placing a sash or a pane of glass upon growing weeds, the upper surface of their leaves will show the large amount of moisture they exhale, the evaporation of which is arrested by the glass, and which would be retained in the soil by the destruction of the weeds. 2. Ground thus often stirred, and loose, absorbs most of the water of showers, and retains it until much of it settles into the soil below; whereas, much of the water thus falling runs off rapidly from a hard surface. 3. The mellowed surface becomes more thoroughly warmed than a hard soil by the noon-day sun, and gives off that warmth more gradually during the night, and the plants are thus surrounded by an atmosphere warmer and of more uniform temperature, during the whole twenty-four hours. 4. But the greatest advantage of frequent stirring is, that the loosened soil acts as a mulching, arrests the ascent of the moisture by a capillary attraction, and keeps the soil in which the roots are acting moist. To secure this benefit of cultivating the land, it ought to be done just as soon as the soil becomes friable, after showers, whether there be any weeds to be eradicated or not. It is a mistake to suppose that the roots of plants are benefited by direct contact with air in the mellowed soil. Air is always injurious to them, and especially so if it be hot and dry. While the plants are growing their roots should not be exposed to the air, nor should the soil in which they grow be disturbed. The full benefit of cultivation may be secured if it be only deep enough to furnish a few inches of fine and loose soil upon the surface. It is often said that the loosened soil absorbs moisture from the atmosphere, and thus aids the growth of plants; but every one can see that the surface dries much more quickly for being stirred, and it is very clear that what little moisture is thus received in the night is very quickly evaporated, and cannot reach the roots, or the soil in which they work.

Apples and Pears in various Climates.—It is curious to observe the wide adaptation of the different sorts of the Pear, when compared with the Apple. A leading correspondent of THE GARDEN, in giving short, select lists of these two kinds of fruit, mentions Winter Nelis, Bartlett, Marie Louise, Capiaumont, Brown Beurré, and Louise Bonne of Jersey as the best among Pears, all of which are well known in this country; and Lord Suffield, Dumelow's Seedling, Alfriston, Cox's Orange Pippin, and Yorkshire Greening among Apples, most of which very few persons in this country have ever heard of. The same writer names Doyenné du Comice, Seckel, and Comte de Lamy, (which proved so fine with us) as among "representatives of the best Pears in existence."—"Cultivator."

THE FLOWER GARDEN.

PRUNING ROSES.

THE climbing Rose flowers upon the wood of the current year. The closer it is pruned the better it blooms at the latter end of the season, the more beautiful are the flowers, and the more numerous the shoots will be for pruning the following year. A Rose tree constantly long-pruned becomes deformed, and produces too many small flowers, whilst a close-pruned Rose tree presents a head like that of a Willow, and wears itself out quickly from the effect of the reflux of the sap, which induces the formation of suckers. By a combination of the two methods, the advantages of both may be secured, for each will neutralise the injurious effects of the other. With the Rose tree pruning to a medium length will be preferable to either the long or short system; but experience shows that in the majority of cases a combination of the two systems is still more advantageous. The following is our method of operation. The best-placed branches are subjected to long pruning, being cut to a length of from 8 inches to a foot, whilst the others are cut back or spurred to two eyes. Badly-placed shoots are cut clean out; young wood better situated will be encouraged to take their place. The shoots pruned on the long system will bloom early, whilst the shoots produced by the short-pruned wood will push out vigorous growths that will be covered with flowers later in the season. The following year this process is reversed; the long-pruned wood will now be short-pruned, whilst the shoots that were previously cut short are now long-pruned, according to their size, and every year this alternation takes place. Sometimes vegetation is retarded, and, should the long wood after their blooming show signs of withering, medium pruning in the middle of the summer will be beneficial. This treatment is somewhat analogous to that bestowed upon the double-bearing Raspberry. If at any time an over luxuriant branch is allowed to grow and bloom, which it will do profusely, if properly managed, it should be cut down, and the young shoots may be then used as cuttings. Under any circumstances, however, medium-sized shoots, especially of the Hybrid Perpetual or Moss varieties, of which the buds are well-formed, will, after having been pruned, blow during the first season, without becoming over luxuriant. I dislike summer pruning. As soon as a Rose has shed its blossoms it is best to leave the shoots uncut, as the terminal eyes are the most floriferous, and any pruning tends to exhaust the tree. This floriferous disposition of the top eyes shows that amongst the more productive kinds—Chromatella, for example—the Rose cultivator should choose his scions from the upper extremity, and immediately below the flowers when possible. These luxuriant branches should be kept back, by a pinching at spring-time, to a length of 12 inches, and the laterals will become floriferous; it is upon these that the pruning of the following year should take place. The best time for pruning Roses is April; autumn pruning induces buds to burst too soon, which are thus rendered liable to injury from spring frosts. By operating whilst the sap is rising the dormant eyes, which have not yet commenced to push, are acted upon. As to non-climbing kinds of Roses, it is better to leave them alone, or to long-prune a certain number of branches, without which they will become over-crowded. The branches should be thinned, by removing some of the superfluous wood. The latter will produce shoots for long-pruning the following year, and the former will be covered with flowers. So soon as the blossoms have fallen they should be again cut back to dormant eyes, or to a well-placed branch. Nothing else need be done to the others, except to restrain them, by pinching-in too luxuriant growths.

Troyes.

C. BALTET.

FRUITING OF THE HARDY PALM IN THE UNITED STATES.

(CHAMÆROPS FORTUNEL.)

WE noticed an article in a recent number of THE GARDEN in regard to this Palm, which you call hardy, as it probably is in the climate of England. We enclose you a photograph of a fine plant of this Palm, which fruited in our collection at Boston last year (1874). You cannot, however, from this form an exact idea of its beauty, as the colour of the fruit enhances this in a high degree. The fruits or berries, which are just the size of small wild Grapes, are of a dark blue colour, covered with a thin coating or skin, which is also dark blue, but entirely covered with a dense rich bloom, like that of the purple Plum or finest black Grape. A cluster of the fruit, exhibited by us two weeks ago before the Massachusetts Horticultural Society, was thought to be an immense bunch of small Grapes. About fifteen years ago we received several small plants of this Palm from London, and two of them were kept for specimens. These have been grown in pots or tubs during the whole period, and the plants are now 8 feet high, with a stem 8 to 10

inches in diameter. They have been grown out of doors every year, from April to November; kept under the stage of the greenhouse when small, but latterly in a cold house in winter. Two years ago one of these Palms produced a panicle of splendid yellow flowers, showing it to be a male plant. Last spring (1874), soon after they were put out of doors, in April, both of the plants began to show their flowers, which were watched with much interest, in the hope that one of them might be the female, as the flowers of the one were much smaller and less showy than those of the other. This proved to be the case. They stood within 10 feet of each other, and without artificial fertilisation the female plant produced three immense compound panicles of berries, 18 inches broad and 70 long, numbering, as near as we could estimate, 3,000. These were fully grown before the plants were removed to the house in November, and might have been gathered, though they had not attained their beautiful deep blue colour; but they were so very ornamental that we allowed them to remain until January, when they were cut off, as the berries began to fall. In your climate the hardiness of this Palm must render it one of the most valuable in cultivation; for, in addition to its robust growth and broad, handsome, deep green foliage, the great masses of deep golden-yellow flowers, lasting, as they did, three to four weeks, are highly ornamental, and the fruit in all stages, particularly after it attains its rich blue colour, is very beautiful. Even in our climate the plants have been allowed to stand in the open air long after every greenhouse plant was safely housed and all kinds of open air vegetation killed by heavy frosts, the thermometer falling as low as 22°, and this without the least browning of the leaves in the case of the Palm. Young plants are wintered in a frame as safely as a Holly or Laurustinus, which, in our cold climate, are killed by the first frost that sends the thermometer down to zero, and we have had ten days of it in January this year. As regards the difference that is said to exist (see p. 517) between the male and female plants, we have not seen it in our two plants. The stem of the male is a little stouter or thicker than that of the female; but, beyond this, no difference is perceptible. Both of our plants are of equal height and breadth, and, in fact, are as handsome a pair of this species of Palm as could be desired; the tubs are 2½ feet in diameter. In our climate, as a lawn plant, for vases, or for ornamental tubs, this Palm possesses the highest merit, for it can be placed out-of-doors a month earlier and kept out a month later than any other Palm, Agave, or tender Yucca—all good plants for such uses. Has this Palm fruited in England?

Boston, Mass.

C. M. HOVEY.

PACHYPHYTUM BRACTEOSUM AND KLEINIA REPENS.

THE first of these is a perfect gem among succulents, its rich creamy colour and neat habit rendering it a conspicuous and most effective object in a mixed bed of its class. Some dislike succulents for bedding purposes; but judiciously mixed beds of them have really a fine appearance. Without the Pachyphytum, however, and its indispensable associate, the Kleinia, with its blue glaucous foliage, the effect is imperfect. Unfortunately, the Pachyphytum can only be increased slowly, and requires to be planted thickly, so that a hundred plants go but a little way. We have been busy propagating it for several years, and have no great stock yet. One way is to top the plants in autumn, potting each top singly in a thumb pot. They are sure to strike on a dry shelf, near the glass, in an intermediate temperature, and make fine plants by spring. The old stumps will break in two or three places during the winter, and in spring the offsets may be detached, and make neat, though small, plants by bedding time. The second way of increasing it is by leaves. These may be detached at any time, taking care to cut them off with just a heel of bark adhering to each, then lay them in a ring, as close as they will lie, round the inside of a flower-pot saucer half filled with soil, the heels of the leaves all pointing inwards, with the base of each just resting on the soil, but not covered. They will want little or no water, and after a considerable time a cluster of little plants will be seen forming at the base of each leaf; when these are large enough to handle, they should be detached, potted, and treated like the others. The percentage of leaves which damp off before the young plants form will be in proportion to the care given in watering, &c. We have a number of young plants coming on in this way at present. The third way is by seed; but the difficulty is to get it. Last October a small plant showed a flower-spike, and as soon as it was observed I had it taken up from the bed, potted it, and put it on the back shelf of our winter Cucumber-house; it flowered, and was fertilised with a camel's-hair pencil in December, and the few pods which it bore ripened seed, which was sown in January in a shallow saucer, and we have now a capital batch of

seedlings up and doing well. The *Kleinia repens* is an equally valuable acquisition, owing to its colour. It is a capital plant for edging, massing, or mixing, and is easily propagated, for every bit will root freely if simply inserted in the soil. We keep it down to a uniform level during the summer by simply topping the longest shoots and sticking them in the ground, and in this way thicken the bed and increase our stock at the same time. Mixed beds of succulents should never be planted where they cannot be planted thickly, almost touching each other in fact. When, therefore, there is not enough for a large bed confine them in a small one rather than intermix them with ordinary bedding plants with which they ill associate. One of our most admired beds last year consisted of four small circles entirely filled with succulents. In the centre was a good plant of *Sempervivum canariense* or *c. giganteum*, and around these *Echeveria metallica*, *E. glauca major*, *Roechea falcata*, and others. *Aeonium arboreum variegatum*, *Kleinia gigantea* and *repens*, *Pachyphytum*, *Sempervivum tabulæforme*, and others, all planted compactly together, and tapering down to a margin of *Sedum luridum* or *hispanicum*; between these and the Grass was a line of *Echeveria secunda glauca*. These beds were filled in May, producing an effect at once, and lasted till November, when the plants were taken up. To produce the desired effect the beds should be well filled with soil, rounded well up in the centre in an easy curve, and be made quite full at the Grass margin, otherwise the outside row of plants will appear as if sunk and lost. Plant also close to the Grass edge, so that when the edging shears are run round the bed the Grass and succulents will meet. If the lawn is kept closely mown with the machine such a bed will then appear like a gem set in a green velvet groundwork. If any gaps or soil are seen the illusion is destroyed at once. I have the edgings of the beds clipped with sheep-shears to avoid cutting the leaves of the plants. A succulent bed is nothing if not kept perfectly trim and neat.

J. S. W.

THE WASHINGTON LILY.

AFTER reading Mr. Bull's letter (see p. 343), I would venture to suggest that the names of the different varieties of *Lilium Washingtonianum* should be considered an open question till these Lilies have again bloomed this season. The history of their introduction I imagine to be this. In March, 1872, Mr. Bull sold bulbs of *L. Washingtonianum* at a guinea each. These, I believe, belonged to the first importation. On the 9th of January, 1873, Messrs. Backhouse & Son sold at Messrs. Stevens's, Lily bulbs, which were thus described:—" *Lilium* (new species?), California, allied to *L. Washingtonianum*; grows 6 to 10 feet high, and bears as many as forty flowers on the spike, very fragrant; regarded by the collector as either a distinct variety of *L. Washingtonianum*, or a new species altogether; very scarce." On the 18th December, 1873, Mr. Bull sold, at Messrs. Stevens's, bulbs with this description:—" *L. purpureum*, this beautiful new Lily has been discovered and sent from Humboldt County, California. The collector writes that it is the finest of all the Californian Lilies, and describes it as producing about twelve flowers on a stem, which are very fragrant. The petals, on opening, are of a beautiful purplish satin colour, changing to a delicate purple-lilac. This importation has been received by overland express, and the bulbs are in splendid condition." When buying these bulbs, I believed them to resemble it closely; if not to be identical with the new species *Washingtonianum* imported by Messrs. Backhouse; and now, on examining the young growth of the two, I think this opinion will prove correct. There is this difficulty about the original *L. Washingtonianum*. It was always said to be a most beautiful Lily. This would not be justified by those first imported, but would by *Washingtonianum purpureum* and by *Washingtonianum* new species; though I doubt their attaining the height described at Messrs. Backhouse's sale. With us last year the two last were dwarfer, and had smaller foliage than the first *L. Washingtonianum*; and now, though the bulbs are well established, this character continues. I should not be surprised if it turns out that we have as many varieties of *L. Washingtonianum* as of *L. canadense*.

Heatherbank, Weybridge Heath.

GEORGE F. WILSON.

An Open Air Conservatory.—Having two rooms with bay windows, and a smaller room with a flat window between them, there is a plot of ground thoroughly commanded by three windows; I propose making this into a sort of open air conservatory, as it faces west, and the sun here is very powerful; we should have a number of rock-work pockets, but only one tier. Some of these pockets would have fixtures in the shape of very dwarf evergreens, such as *Skimmia japonica*, the dwarfiest *Retinosporas*, *Sedums*, *Gaultheria procumbens*, &c., but most would have a space kept open by an empty flower pot, into which plants in pots,

which which had been brought into bloom elsewhere, would be placed and renewed as required; by this I should hope that, especially in spring, a space might be kept furnished, as in a conservatory with beautiful flowers, where they would be thoroughly seen from the house, and that the protection of the stove would prevent their being much damaged by wind, rain, or sun. Any experience in this direction, given in your columns, will be thankfully received.

—GEORGE WILSON, Heatherbank, Weybridge.

Hardiness of the Japan Primrose (*Primula japonica*).—

I find this Primrose to be perfectly hardy in North Yorkshire, where it has been exposed to one of the most severe winters which we have had since its introduction into England. I thought last January, after the snow has disappeared, that all my plants of it were annihilated, for the foliage had disappeared, and nothing was to be seen but the heart. New foliage is, however, now appearing, and flower-stems are beginning to show themselves. Plants in pots, which have had the protection of a cold frame, are of course in a more forward state; and my strong seedlings potted in September look much better than two-year-old plants, and promise to bloom first. For pot plants intended for windows, strong seedling plants, potted in September in a compost of turfy loam mixed with a liberal proportion of leaf mould and rotten dung, are suitable. I use long narrow pots, 5 inches diameter at the top and 11 inches deep, such as are used for Hyacinths. It is a plant which requires a deep pot, in order that its long, thick, fleshy roots may grow downwards. It requires a great quantity of water, and should be supported with frequent doses of liquid manure. If grown out of doors, the flower-stems should be supported by small flower sticks, in order to protect them from injury from wind and rains.—H. T.

The Old Parma Violet.—Gradually, and almost imperceptibly, the old and thoroughly appreciated Parma Violet is, says the "Revue Horticole," disappearing from amongst the cultivated varieties; and its place is being usurped by another kind, which certainly has the same name and appearance, but none of the qualities that rendered the genuine variety such a favourite flower. In the true Violet of this name are combined a delicate blue colour which is most charming to the eye, and a remarkably sweet scent, so peculiarly its own that it can only be described as the scent of the Parma Violet. Now-a-days, that which is sold, even in large quantities, under the name in the markets, has a somewhat fuller flower and a deeper shade of blue. The leaf also is slightly smaller, and more regularly orbicular; but the flower has a singularly disagreeable scent, and, therefore, can never compensate us for the loss of one of the most sweet-scented of all Violets.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Parsons's White Mignonette.—I am cultivating this very valuable addition to our gardens, and am pleased to state that in whiteness, size of flowers and spike, and fragrance it is worthy of all praise.—W. S.

Chamaepeuce diacantha.—"N. H. P." (see p. 345) probably fails with this through treating it too well. Here it is naturalised, sows itself, and comes up freely. Occasionally I take a head of seed and sow it broadcast anywhere, and it takes very good care of itself.—H. N. ELLACOMBE, *Bitton Vicarage*.

Variegated Arabis and Aubrietia purpurea.—These planted as edgings to spring beds plant for plant are now singularly beautiful. Another mixture worth recommending is *Thymus citriodorus aureus* and double red Daisies. A third, a bed of Belvoir Yellow Wallflower with an undergrowth or carpet of *Myosotis dissitiflora*. The latter and variegated Arabis also make a very good mixture.—N. H. P.

Pretty Hyacinth Bed.—One of the prettiest flower-beds that could be designed is made up of Baron Van Tuyll for centre or back, then a line of white Grand Vainqueur, followed by a row of Robert Steiger, the whole being edged with the pretty though common Golden Feverfew. Taking notes of such effective displays when the plants are in flower is the best way for amateurs to arrange for next year's planting.—ROBERT McKELLAR, *Abney Hall*.

Variegated Plants.—Extremely beautiful is the variegated Comfrey (*Symphytum officinale variegatum*) which has large leaves exquisitely margined and streaked with cream colour. What makes a plant so beautiful if regularly variegated is that attention is thereby directed to the form and outline of each individual leaf. A Clover which I found in the fields is now a mass of creamy-white and rich green, and one of the most striking hardy plants I have ever seen.—FRANK MILES, *Bingham, Notts*.

American Cowslips in the North of England.—*Dodecatheon splendendum*, *Meadia*, *elegans* (syn. *giganteum*), and *album*, I have all in one little bed with an east aspect and light soil, and they all thrive well and flower more effectively the longer they are left undisturbed. The first named was long favoured with a place in a cold frame, but it does better in the open ground, and is now in flower, beating, in this respect, by a long way, all its companions. *D. Jeffrayanum* thrives with me under different treatment, namely, in a shady and cool position in ordinary garden, but somewhat moist, soil.—G. F., *Henham*.

Fritillaria uniflora.—This is a beautiful spring-blooming bulbous plant, the leaves of which resemble those of some of the Snowdrops. The blooms rise about 6 inches above the ground, and are composed of six white bluish-tinted petals, with a most delicious fragrance. It flowers freely during March, April, and the beginning of May. I lately saw a number of these plants doing well in rich open soil in a somewhat shaded position; and, although surrounded with many Dog's-tooth Violets and other pretty spring flowers, I thought this compared favourably with any of them.—J. MUR.

Old Writers on Daffodils.—I observe that "Hill" is uniformly called "Hale" in the article (see p. 343) on double Daffodils.—JAMES BRITTEN.

GARDENING FOR THE WEEK.

Flower Garden and Pleasure Ground.

It is yet unsafe to take bedding stocks from under glass, unless protection of some kind is in readiness to be applied whenever there is any appearance of danger from frost. Continue, however, to give abundance of air whenever the weather is at all favourable, in order to harden and prepare Geraniums and other bedding plants for being planted out soon after the middle of this month. The hardy Fernery or rock garden will now be interesting, and will require its share of attention. Slugs and snails are frequently troublesome in this department at the present season, and take refuge during the day under blocks and stones, where they should be searched for and destroyed. Continue to frequently roll gravel walks soon after rain, also lawns and Grass verges. If the lawn is in any degree mossy the present is a suitable time to endeavour to improve it; this may generally be done by encouraging, as much as possible, the growth of the finer Grasses, by means of slight surface dressings of some enriching material, such as finely-sifted soil, lime, wood ashes, and soot. But in situations under trees and elsewhere where Grass cannot be induced to grow satisfactorily, Moss should be encouraged rather than otherwise; for, although it is apt to become somewhat brown during dry weather, it nevertheless quickly regains its green hue after a shower or two. Attend carefully to recently transplanted trees and shrubs; and, if the weather continues dry, water frequently at the roots, as well as overhead, by means of the garden-engine, on the evenings of bright sunny days. Doubtless all necessary arrangements regarding the furnishing of beds, borders, baskets, and vases were decided upon last autumn, and the materials required for effectually filling them selected; but, should a deficiency in any instance be apprehended, it is not yet too late to remedy the omission; the stock of such species of plants as Verbenas, Lobelias, Petunias, Coleus, Iresines, and the Alternantheras, of various sorts, may still be increased. In the arrangement of the various species of decorative plants in the flower garden, it may hardly, perhaps, be necessary to caution the planter against the too free use of the primary or bright colours, or to say that undue breadths of scarlet and yellow are seldom consistent with tasteful arrangement, unless judiciously toned down by the moderate use of plants of remarkable and ornamental foliage, in order to prevent any approach to a glaring effect; while anything like monotony or flatness should be prevented, or may be greatly relieved, by the judicious introduction of statuary of some kind, such as vases, fountains, &c., together with standard and pyramidal plants of various sorts, as single specimens, in centres of beds, and upon the turf. The latter may consist of such species as Fuchsias, Pelargoniums, Cytisus, Acer Negundo variegatum, &c.; while trained to wire arches, and similar devices, many ornamental climbing plants may with advantage be introduced, such as the various varieties of the beautiful new Clematises, and some of the stronger growing tuberous-rooted Tropæolums. The flowers of many of the Clematises are exceedingly beautiful, some of them being of a colour greatly required in the flower garden, and they may be used with advantage as bedding plants, merely requiring, in fact, attention in the way of regulating and pegging down the shoots. The style of planting flower beds, known as carpet bedding, may not, perhaps, meet with universal approbation, but the system may, nevertheless, be to some extent introduced to most flower gardens with advantage, were it for no other reason than the circumstance of its calling into use many of our most interesting and curious looking hardy plants, remarkable for their dwarf and compact habit of growth and colour of foliage, such as the following, viz., *Achillea umbellata*, *Ajuga reptans rubra*, *Antennaria tomentosa*, *Arabis lucida variegata*, *Artemisia frigidi*, *Aubrietia deltoidea variegata*, *Cerastium tomentosum*, *Leucophyton Browni*, *Oxalis corniculata rubra*, *Santolina incana*, many of the Saxifrages, the new Golden-margined Thymes, &c., together with many suitable succulent plants, hardy as well as tender, including *Echeverias*, *Sempervivums*, *Crassulas*, *Dasyliirions*, *Cotyledon pulverulentum*, *Fourcroya longæva*, *Kleinia ficoides*, *Pachyphytum bracteatum*, *Agaves* of various sorts, &c. These, with the beautifully coloured *Alternantheras*, the *Coleuses*, the Golden Feather *Pyrethrum*, and the *Stellaria graminea aurea*, &c., form some of the principal material required for this style of embellishment, which, when tolerably well done, seldom fails to attract attention, and frequently commands admiration. There is also another style of planting, generally known as sub-tropical, which frequently produces a pleasing effect. The plants used for this purpose principally consist of tender species, such as the *Abutilons*, *Acanthuses*, *Amarantuses*, various sorts of *Cannas*, *Chamæpence Cassabonæ*, *Datura fastuosa*, *Echeveria metallica*, *Erythrina crista Galli* or the Coral tree, *Ferdinanda eminens*, *Ferula*

gigantea, *Melanthus major*, *Nicotiana glauca*, *wigandioides*, &c., *Phormium tenax*, the various sorts of *Ricinus* or Castor Oil plants, *Solanum marginatum*, *robustum*, and *Warcewiczii*, *Wigandia caracasana*, the Striped Japanese Maize, &c., most of which it would be unadvisable to plant out earlier than the first week in June, as their magnificently large leaves are liable to be injured by slight frosts and boisterous winds, which the ordinary occupants of the flower garden generally endure with impunity; and this circumstance renders sub-tropical plants unsuited, as a rule, for situations much exposed to high winds.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Indoor Fruit Department.

Vines.—In some places Geraniums and other bedding plants are grown on Vine borders to their detriment, though their presence in such situations is not wholly inimical to the welfare of the Vines, inasmuch as in hot dry seasons the shade which they afford protects the Vine roots. In planting bedding plants on Vine borders, it is not advisable to carry them up too near the house, as in that case the Vine roots might be interfered with. The distance to be left clear should be regulated by the quantity of roots near the surface and the width of the border. Six feet of a border 12 feet wide may be planted with impunity with Geraniums, Calceolarias, and other somewhat deep-rooting plants; and when more than that distance is wanted to be covered with plants, such surface-rooting varieties as Verbenas and Lobelias should be used. I have known a few inches of rich soil to be laid on the surface of the Vine border at bedding-out time for planting in, and removed again when done with in autumn. In that case, the Vine soil was in no way injured. In all cases the top soil should be well enriched with manure before planting, so as to keep the roots near the surface. Early Grapes in general will now be colouring. The borders will, therefore, not need watering before the fruit becomes nearly ripe, as much water at the root after that time does not improve the flavour. A temperature of 65° at night, and 10° or 15° degrees more during the hottest part of the day, finishes Grapes well; and a circulation of fresh air with these day heats, gives a higher and more perfect flavour than would be obtainable in a confined atmosphere. Sun heat is considered to be much more advantageous to the finishing of Grapes than fire heat; but, no doubt, the abundance of fresh air which sun heat admits of being given, is quite as favourable for the proper ripening of Grapes as the solar rays.

Pines.—With longer days and more sun-heat there is not so much danger of over-damping now in the case of Pine plants, as there was when these were not obtainable. A moist atmosphere is of much benefit in the case of a strong heat being given. When the plants are syringed overhead in the morning, careful ventilation is needed to prevent the leaves from getting burnt with the sun before they are quite dry, but once a day is quite often enough to syringe even in the summer time, and the best time for this operation is when the ventilators are finally closed. The moisture then supplied is generally sufficient to last till the following morning. Leave nothing undone which will in any way assist the development of successional plants. Watering at the roots, but at the same time guarding against saturation, must be particularly attended to. Experience soon teaches the happy medium between these two extremes. May and June are months of which every Pine grower should make the most, as subsequent months should be depended on more for maturing growth than making it. In order to have Pines ripe every week in the year the succession should be regulated so as to have one or two showing fruit every other week. A few Smooth Cayennes or Jamaicas must be got into fruit now, or there will be a gap in the supply in autumn when the Queens are consumed.—J. MUIR.

Kitchen Garden.

On the morning of the 22nd inst. we had here 7° of frost, but, everything being dry, the damage done is trifling. It is astonishing how effective a very slight protection is as a shield against spring frosts. An old fishing net, supported on sticks over beds of early vegetables, such as Cauliflowers, Cabbages, Carrots, Lettuces, &c., a couple of feet or so above them, helps to forward the crop through our cold springs wonderfully, slight and inexpensive as such a covering is. Some time ago I was noticing the difference presented by four rows of Beck's Gem Peas, sown side by side on the same day; two of these rows had been covered with the ordinary wire Pea guards, whilst the others were altogether unprotected, and there was a very marked difference in favour of those to whom this shelter had been extended. There cannot, I think, be a doubt that early crops of vegetables may be much forwarded by the simple expedient of netting them over. This acts in two ways; it checks radiation and, at the same time, breaks the force of cold currents of air, and thus raises the temperature round the plants growing immediately beneath it. The first lot of Scarlet Runners should be planted with-

out delay; this is one of the most useful vegetables grown, and should be planted in quantity. A row or two may be planted on a warm site to come in early; whilst the main crop should be grown on deep, rich land, and allowed plenty of room between the rows, but the height of the sticks will in some measure form a guide; as, by pinching and stopping, Beans can be grown to any height between 3 and 7 feet; and, if tall sticks are used, which are, on the whole, the most profitable, 6 feet between the rows will not be too much. It is desirable also to have the drills or trenches a little below the natural surface, especially on dry soils, to facilitate watering. Any or all of the following Peas, may be sown as desired for succession crops:—G. F. Wilson, Veitch's Perfection, Huntingdonian, and Maclean's Best of All. Cabbages now turning in may have the leaves drawn together and a string of matting or roffea tied loosely round to hold them together and induce them to heart more quickly.—E. HOBDAV, *Ramsey Abbey*.

NOTES OF THE WEEK.

— AMONG the most interesting of all plants exhibited at Regent's Park on Wednesday last, were profusely-flowered examples of the well-known deep blue coloured *Lithospermum fruticosum*. As generally grown, this is a shrubby hardy plant, which spreads in dense mat-like masses over dry banks or rock-work. The plants here alluded to, however, were trained in the form of little standards, and, grown in this manner in small pots, we know of no more beautiful blue-flowered plant for indoor decorative purposes.

— A FINE large-flowered form of the rosy North American Lady's-slipper *Cypripedium (humile) acaule* is now blooming in Mr. Bull's collection at Chelsea. The beauty of this graceful plant consists in its great pouch-shaped lip, which is of a remarkably delicate rosy-flesh colour, and very curiously folded in front. *Goodyera pubescens*, also from the North American woods, is likewise very effective, its ovate cushion-like leaves being of a soft velvety green, delicately netted and embroidered with silvery veins. Both are plants of easy culture, and succeed in a humid greenhouse temperature, and also in the open air.

— ON April 16, a meeting of botanists from various parts of Scotland (says "Nature") was held at Perth, to hear the report of the committee (appointed at the Fungus Show held in Aberdeen last autumn) to organise a Scottish Cryptogamic Society. A constitution was adopted, and office-bearers were elected for the present year, the President being Sir T. Moncreiffe of Moncreiffe, Bart.; Vice-president, Professor Dickie, Aberdeen; Secretary, Dr. Buchanan White, F.L.S. It is intended to have a show of Cryptogamic plants, especially of Fungi, every year in various districts of Scotland in rotation, and the show for this year is to be in Perth in the last week in September, when it is expected that a very large number of specimens will be exhibited.

— THE Royal Exotic Nursery at Chelsea is just now well worth a visit, early-flowering Orchids and stove and greenhouse plants being in excellent condition. In one of the stoves are forty large plants of *Anthurium Scherzerianum* in full flower, some of them bearing from twenty to thirty spathes each. Among *Phalænopsis* the following are in bloom—viz., *P. grandiflora*, *P. amabilis*, *P. Ludemanniana amethystina*, *P. L. ochracea*, and the exquisite *P. Parishii*, one of the most delicate and exquisite of all Orchids. In the cool houses many kinds of *Odontoglossum* are in great beauty, and among them the soft rosy *O. vexillarium*, bearing ten fine flowers on two spikes; several others, also, show strong flower-stems. *O. Alexandræ* is represented by several beautiful varieties, including *O. Alexandræ Veitchii*, which promises to surpass the beautiful *O. Andersonianum* in profuse purplish-brown markings. Early *Rhododendrons*, *Clematises*, *Hydrangeas*, and other decorative plants, are also now finely in bloom.

— ONE of the most attractive objects in Hyde Park just now is a large plant, or rather small tree, of *Magnolia Soulangeana*, profusely covered with its erect bell-shaped flowers, of wax-like consistence and pearly whiteness, except the outsides of the perianth segments, which are suffused with purple. This tree is about 12 feet in height, and about the same in diameter. The branches droop gracefully, and the erect, sweetly-perfumed flowers which terminate the extremity of every branchlet, give a candelabrum-like appearance to the whole plant which grows on the undulating strip of fresh green turf a few yards from Albert Gate.

— APPLICATIONS for space in the British section of the Philadelphia International Exhibition of 1876 are numerous, and of a satisfactory character. In consequence, however, of recent arrangements, by which the time for space required is extended, it will be possible for the British Executive to receive applications from intending exhibitors, addressed to 5, Craig's Court, Charing Cross, up to the 15th of May inclusive.

SOCIETIES AND EXHIBITIONS.

ROYAL BOTANIC SOCIETY.

APRIL 28TH.

AMONGST the chief attractions of this exhibition were the Roses in pots, which were well flowered and unusually fragrant. There were also interesting groups of new and rare plants, and the Metropolitan Floral Society took advantage of the occasion to hold its Auricula show in the conservatory. The more remarkable of the usual exhibits included a fine collection of foliage and flowering plants from the Royal Exotic Nursery, Chelsea. Among these we noticed various *Dracenas* and *Crotons*, including *C. Lord Cairns* and *C. Disraeli*, two very distinct kinds, sent to Messrs. Veitch by Mr. Macaffee, of Sydney; also a fine panful of the new and distinct bluish-tinted *Echeveria Peacockii*, one of the best of the genus for pot culture; *Nepenthes intermedia*, a garden hybrid, of compact habit, with bright green foliage, and pitchers resembling those of *N. Rafflesiana*; the same firm also sent a panful of the purplish-fruited *Anthurium (Violaceum) margaritaceum*; *Cypripedium Schlummi* var. *album*, and various other Orchids. Mr. Bull had several new *Dracenas*, including the rosy and white-striped *D. Hendersoni*, *D. rubella* (a kind with lance-shaped bronze-green leaves, margined with bright rosy-crimson), *D. elegantissima*, and the dense-habited *D. candida* (a miniature form of *D. regina*), and various Orchids; a plant of the white drooping-flowered *Crinum brachynema*, with eight flowers on a scape; and three singular *Arads* in bloom, consisting of *Dracontium asperum*, a kind having dark brown cowl-shaped spathes; *Amorphophallus campanulatus*, with upright bell-shaped blotched spathes; and the trifoliate *Typhonium Brownii*, with glossy leaves, and large bowl-shaped spathes of a rich maroon tint inside and glossy green without. Mr. B. S. Williams furnished an effective group of new Orchids, Palms, Ferns, Cycads, and succulents; among these we noticed *Gloneria jasminiflora*, a plant having opposite leathery leaves of the tenderest green, and clusters of tubular pure white flowers, borne on the tips of the axillary branchlets; a small plant of *Magnolia Hennii*, bearing two large fragrant flowers, white within and deep rich purple without. The same collection also contained various Ferns and Orchids, the latter consisting of several well-flowered *Dendrobes* and *Odontoglossums*. Messrs. Rollisson staged a well-grown group of Palms, Ferns, Orchids, and other plants, among which we noticed the handsome *Gymnogramma decomposita*, four elegant and vigorous little specimens of *Cocos Weddelliana*, the rich bronze-leaved *Dracena stricta*, *Maranta Makoyana*, and two healthy plants of *Vanda suavis*; also a vigorous and finely-coloured specimen of the beautiful *Croton Wisemanii*. Messrs. Cutbush had a well-arranged miscellaneous group of Palms, *Spiræas*, *Azaleas*, and other spring decorative plants.

Stove and Greenhouse Plants.—In Mr. Ward's collection of these was a plant of *Odontoglossum Pescatorei*, bearing two branched spikes, on which were seventy-three flowers; also the large-spathed *Anthurium Scherzerianum* (figured in THE GARDEN at p. 317), and which, on this occasion, bore six fine spathes and one unopened bud; likewise one large *Anthurium*, bearing twenty-five spathes; and good plants of the crimson and white *Clerodendron Balfourii*, the rich orange-flowered *Ixora salicifolia*, the fragrant white-flowered *Rhynchospermum jasminoides*, some well-grown Cape Heaths, and other plants. Fine standard *Azaleas* came from Mr. Turner, of Slough, among which we remarked *Comtesse de Flandres*, a kind with large elegantly crisped rosy-lilac flowers; *Reine des Fleurs*, with salmon white-edged flowers, the upper segment being spotted with crimson; *Duc de Nassau*, one of the best of rosy-flowered varieties; and *Cedo Nulli*, a good lilac-purple, one dense mass of bloom. Messrs. Lane & Son had half-a-dozen conical-shaped plants, one of which, *Roi d'Hollande* had large smooth flowers of a remarkably vivid scarlet. Mr. J. James, gardener to W. F. Watson, Esq., of Isleworth, had six well-bloomed little *Azaleas*, among which were *Roi des Doubles*, a kind having rosy-lilac compact rosette-like flowers; and *Mars*, a small-flowered vivid scarlet variety. Messrs. Dobson also had six well-bloomed plants, as had likewise Messrs. Cutbush and Wheeler. Mr. Carmichael, gardener to H. Tugwell, Esq., Crowe Hall, exhibited half-a-dozen hybrid *Azaleas*, the stock of which has, we believe, been purchased by Mr. B. S. Williams. One of these, named *William Carmichael*, is a hybrid between the small purple-flowered *A. amoena* and *Flag of Truce*, a double white-flowered kind; Mrs. Carmichael is a hybrid between *Amoena* and *Stella*. These, as well as the others, were free-blooming decorative plants, which promise to prove very valuable, and are quite distinct. A large-flowered hybrid *Rhododendron*, named *Countess of Dudley*, came from Mr. C. Turner. It was 4 or 5 feet in height, and bore twenty or thirty trusses, each flower of which was nearly as large as that of *Lilium longiflorum*, but shorter in the tube. Its foliage is fresh and glossy, and its snowy wax-like flowers have a scent like that of a wild Rose. The same exhibitor also staged a large-flowered white or rosy-striped *Azalea*, named *Apollo*, a profuse-blooming kind. Messrs. Lane had a dozen well-bloomed *Rhododendrons*, among which was the well-known *R. fastuosum*, still one of the best of the double-flowered kind. Well-bloomed collections of *Cinerarias* came from Messrs. Dobson and Mr. James. Mr. Barnes, gardener to A. Chancellor, Esq., The Retreat, Richmond, furnished six well-flowered pyramidal specimens of *Parson's White-flowered Mignonette*, a very fragrant and good kind. Roses were shown in excellent condition by Mr. Turner, among whose plants were examples of *La France* and *Le Mont Blanc*, the latter a delicate sulphur-flowered Tea-scented variety; the rich crimson-flowered *Duke of Edinburgh*, *Madame Thérèse Levet*, and *Paul Verdier*, a full rosy-purple Rose with fine foliage. Mr. W. Paul had half-a-dozen small

plants of his new Hybrid Perpetual Rose, named Peach Blossom, a fine kind, delicate in colour, and deliciously scented. Mr. John Walker, nurseryman, Thame, Oxon, had two superb stands of Maréchal Niel, the flowers of which were perfect in form, and of the most exquisite wax-like substance; also a stand of Gloire de Dijon and Maréchal Niel mixed.

Hardy Herbaceous Plants.—Of these Mr. Parker, of Tooting, had a good collection, in which were the yellow-flowered *Corydalis* (*Fumaria*) *nobilis*, *Dielytra* (*Dicentra*) *spectabilis* *alba*, the pearly-white Wood Lily *Trillium grandiflorum*, *Scilla amœna*, a dense mass of the purest cerulean blue, a potful of the rich crimson golden-eyed *Primula elatior* Early Admirable; also well-grown examples of the dense snowy-flowered *Iberis linifolia*, and the golden-rayed *Doronicum austriacum*, *Scilla italica*, and a good specimen of the deeper purplish-blue variety of *Scilla nutans*. In the same collection were the blue and purple-flowered *Orobis cyaneus*, the double-flowered Marsh Marigold (*Caltha palustris* fl. pl.), and *Primula elatior* Golden Plover, masses of bright orange-yellow flowers. Associated with these were also a small plant of the Fennel-leaved Peony (*Pæonia tenuifolia* fl. pl.), bearing four rich-fringed petalled double flowers of the richest crimson-scarlet; a dense little encrusted Saxifrage, named *Saxifraga aretioides primulina*, bearing slender stems, 2 or 3 inches in height, and having primrose flowers; *Anemone nemorosa rubra* fl. pl., with semi-double whitish flowers, tinted with flesh colour, each as large as a shilling; a dense tufted purple-flowered Violet, named *Viola Delabordei*, with small heart-shaped leaves, and well worth a place in select collections in which hardy spring flowers are grown; a pan of the Three-leaved Cuckoo-flower, *Cardamine trifoliata*, furnished with dense clusters of milk-white flowers, on stems an inch or two above the fresh carpet formed by its glossy leaves; and a plant of the dwarf double Marsh Marigold, bearing rosette blooms as large as a shilling, and of the most brilliant orange-yellow. Mr. G. Wheeler also had a miscellaneous collection of hardy early spring flowers in pots. A collection of Alpine and show Auriculas, in excellent condition, came from Mr. Turner. Amongst these the following received certificates, viz.:—*Gertrude Knight* (Turner) a black green-edged variety; *Iron Duke* (Turner), an alpine with velvety black margin, suffused with purple; *National* (Turner), a fine flower of the deepest velvety purple, with sulphur-tinted paste. Messrs. Carter & Co. exhibited their beautiful new *Coleus*, named *Duchess of Edinburgh*, and also a basket densely carpeted with a variegated form of the common Musk, named *Mimulus moschatus variegatus*. Mr. J. Douglas, Loxford, contributed a fine basket of that best of all Primroses, *Primula cortusoides amœna*, with tall scapes of rosy-purple white-eyed flowers. The white and lilac varieties were also shown for comparison. Mr. J. Chambers sent six plants of a *Cineraria*-leaved *Primula*, named *P. mollis*, said to be a native of Bhotan; the flowers in size and colour resemble those of a pale-flowered *P. japonica*, and are borne on loose hairy scapes. Messrs. E. G. Henderson had a charming group of miscellaneous decorative plants, among which were dense headed little trained standard plants of the lovely blue-flowered *Lithospermum fruticosum*, and two baskets of *Bellis aucubæfolia*, including a white quill-flowered variety, named *Flower of Spring*. In this collection were also some graceful little fresh green plants of *Sonchus pinnatifidus*, and the still more slender-leaved *S. elegantissimus*, both of which are graceful plants for table decoration. In the same group were one or two distinct zonal and variegated bedding *Pelargoniums* and some distinct and effective double *Cinerarias*.

The following New or Rare Plants received Certificates:

Odontoglossum Roezlii album (Williams).—An effective variety of a well-known and beautiful Orchid, perfectly white, except a blotch of lemon-yellow at the base of the lip. Mr. W. Bull likewise had a plant of this variety, to which a certificate was also awarded.

Metroxylon filare (Williams).—A distinct and effective decorative Palm, with pinnate leaflets of the freshest green tint.

Gloneria jasminoides (Williams).—A distinct and very beautiful decorative plant of shrubby habit, having opposite leaves, oblong in form and of leathery texture. Its flowers are borne in clusters at the apices of axillary branchlets, and are pure white in colour, tubular in form, and slightly downy.

Tillandsia musaica (Bull).—A Bromeliaceous plant from New Granada, having slightly pale green foliage transversely marked with deep green. Its flowers are rich orange-yellow on yellow bracteate spikes. A very effective and permanent stove foliage plant.

Crinum brachynema (Bull).—A fine Amaryllidaceous plant, bearing pure white deliciously-fragrant bell-shaped flowers on cylindrical scapes from 2 to 3 feet in height. Well worth growing for cut flowers, or as a stove decorative plant.

Typhonium Brownii (Bull).—A trifoliate *Arad*, bearing large bowl-shaped spathe of a rich maroon colour inside and shining green outside. An interesting stove curiosity.

Dracæna insignis (Bull).—A very effective and distinct addition to a well-known group of stove foliage plants. It has lance-shaped foliage of a bronze-like brown, margined with deep rosy-crimson.

D. candida (Bull).—A dwarf and compact-habited plant of the *D. regina* section, but much neater in habit, and its colour is better at an earlier stage of its growth. It grows about 15 inches in height, and has fresh green foliage, margined or striped with white or creamy-yellow.

D. elegantissima (Bull).—Similar to the last in habit, but furnished with long slender bronze-tinted leaves, margined with bright rosy or crimson. This and the two last are well worth culture as plants for table decoration.

Thrinax nobilis (Bull).—This is one of the most beautiful of all the species. It has bright green fan-shaped foliage, which does not appear to be affected with the rust which destroys the beauty of *T. gracilis* and other kinds. It is a stove Palm of easy culture.

Rhynchosperma robusta (Williams).—A graceful pinnate-leaved Palm, *Wallichia*-like in habit, having fresh green leaflets borne on glaucous or downy petioles.

Croton Disraeli (Veitch).—A distinct and effective plant, furnished with broad three-lobed or halberd-shaped leaves of a glossy green, and spotted with golden-yellow. One of the most interesting and remarkable of all the *Crotons* now in cultivation.

C. tortile (Veitch).—A strong-growing plant, with green bronze-tinted

leaves, spotted with crimson, the leaves being curiously twisted or contracted like a corkscrew.

Dracæna hybrida (Veitch).—A fine new hybrid raised in the Royal Exotic Nursery, and described by us last week.

Croton appendiculatum (Veitch).—A singular green-leaved variety, the blade of which in places is reduced nearly to the mid-rib, and again enlarged towards the apex. The ends of the leaves hang down in a most peculiar manner.

Dracæna elegantissima (Veitch).—A slender crimson-margined variety, likely to be much used for table and stove decoration.

Bertolonia Van Houttei (Van Houtte, Ghent).—A dwarf-habited plant, with oblong carmine veins and delicate markings on a velvety ground-work of the richest and freshest green colour imaginable.

B. Mirandæ (Van Houtte, Ghent).—Similar to the last, but the colouring on the velvet-cushion-like surface of the leaves is confined to the minute dots or spots of rosy-carmine. Both are very beautiful, and will be useful additions to a warm humid stove.

Freezia Leichtliniana (Colchester Bulb Company).—A bulbous-rooted plant, from the Cape, resembling a *Babiana* in habit of growth, and furnished with linear hairy leaves. Its flowers are of a pale sulphur-yellow, marked with rich orange in the throat, and are similar in shape to those of a *Tuberose*; while their perfume resembles that of a *Primrose* or *Auricula*.

Sonchus elegantissimus (E. G. Henderson).—One of the most graceful and fairy-like of all fresh green-tinted decorative plants. Specimens a foot high will be very useful for table decoration; and, as it grows freely, it ought to become very popular for this purpose, as well as for stove or greenhouse decoration.

NOTES AND QUESTIONS—VARIOUS.

Large Flowered Dog's-tooth Violet (*Erythronium giganteum*).—I saw this at Belvoir the other day. It is more like a little Lily than a Dog's-tooth Violet. It is of a yellowish colour, very beautiful, and should be in every garden.—FRANK MILES.

The Peruvian Daffodil (*Ismene Amancaes*).—This, until re-introduced by us last season, and again this, was quite lost sight of. The plant from which I send flowers has been grown in a warm house, but we had it in blossom here last season out of doors much later. It may be readily forced.—THE NEW PLANT AND BULB COMPANY, Colchester. [The flowers sent were deep yellow and sweet-scented.]

Keeping Down Weeds.—This is the best season for checking the growth of weeds by means of constant hoeing. Groundsel, Chickweed, and the annual Meadow-grass, should be hand-gathered if in flower or seed, and either burned directly or mixed with quicklime. The little extra time required to kill weeds now will be saved long before the autumn.—R. P. B.

Chamæpeuce diacantha from Seed.—Your correspondent "N. H. P." must have patience with his seed of this plant, as it usually comes up in successive crops. I have generally found that a few started early, but the bulk of the sowing will remain quiet for weeks or months. But little heat is requisite.—W. THOMPSON, Ipswich.

White Broccoli.—Will some of your correspondents inform me what varieties of the above I may grow to ensure a supply of good white Cauliflower-like heads. Out of half-a-dozen varieties sown last year five out of every six have turned out to be of the Brimstone class.—AMATEUR SUBSCRIBER.

Best Time for Planting Potatoes.—I cannot agree with "J. S. W." that the end of April is soon enough to finish planting the main crops of Potatoes. It may do in cold soils and situations, but to make it apply to all parts of the kingdom is quite a different thing. The end of March is considered late for planting in this neighbourhood.—J. GROOM, Henham Hall, Suffolk.

I think, in our eagerness to be first every season, we gardeners have upset, by early planting, the custom of our fathers. I remember, in my youth, which was passed in the north-west of England, in the cotton manufacturing districts, that the mill hands used always to reckon on putting in their crop of Potatoes at Whitsuntide, which is usually far on in May or early in June. The station master, when I came here, was a Yorkshireman, and never, under any circumstances, did he put in any Potatoes for his main crop before May, yet he always had good crops, and a less percentage of disease than any of his neighbours. Had we not better go back to the old path?—N. H. P.

Canker in Young Apple Trees.—Canker has made its appearance here in spots on the stems of our young trees, and spreads gradually around the stems, eventually destroying the whole of the upper portion. The trees in question are standards, four years old, and are growing in heavy soil on limestone and gravel. What, therefore, in the opinion of your correspondents, is the cause of the canker, and what remedy would they recommend?—A. B.

Double Cinerarias from Seed.—I have throughout the late winter carefully tended my stock of what I supposed were true plants of double Cinerarias, in the expectation of having something worth looking at in the spring, and my disappointment may be imagined when I found that, instead of a good display of double blooms, I only obtained worthless single flowers—a result most vexatious after the care bestowed on them. Have others been equally unfortunate?—T. B. WILSON, Claydon Park, Winslow. [Messrs. E. G. Henderson showed a collection of these Cinerarias on Wednesday last, raised from seeds, and among them were flowers as full and fine as those of the best double Daisies.]

Writing on Zinc Labels.—Few labels are better than those made of zinc provided their oily surfaces are carefully cleaned with fine emery paper before writing upon them. Their permanency, however, may be very much extended by warming the label after it is written, and rubbing it over with a paraffine candle. This protection to the writing I have found to be very effective, but I intend to make a further experiment in the way of coating the warm label with hard spirit varnish, as the photographers serve their negatives. Perhaps some of your correspondents may have tried this experiment, and can give us their experience.—W. H. C. CULLINGFORD, Phillimore Gardens, Kensington.

Darlingtonia californica.—The finest specimen of this singular plant in Britain is doubtless that at Glasnevin, whose flowering for the first time we had occasion to notice somewhere about this time last year, it is just now showing flower again. It was this plant which furnished the splendidly-developed pitchers with which the President of the Royal Society illustrated his lecture, delivered before the British Association last autumn at Belfast. Their dimensions will be probably considerably increased this season, as the plant has been transferred from the pot in which it was growing to a pan of large dimensions, where it will have a larger feeding ground for its roots.—"Irish Farmers' Gazette."

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

A ROCK-GARDEN ON MAY-DAY.

ROCK-GARDENS are now becoming so general all over the country, and so much interest is felt in the development of this kind of gardening, that any remarks upon the appearance presented by Alpine plants at different seasons are likely to prove serviceable. Throughout the year, but more particularly after the month of February, many of the rock-work compartments present each day some new and interesting feature, and it is pleasing to observe the numbers of amateurs who may be constantly seen taking notes of the plants as they come into flower in the Edinburgh and other public gardens which happen to possess facilities for their cultivation. In order to render as much assistance as possible to those who are seeking for information on this subject, I am endeavouring to draw up a list of all the more interesting early bulbous and Alpine plants as they come into bloom, giving at the same time their dates of flowering. Such a list, I have reason to believe, will be useful to those who desire successions of Alpine plants in bloom, but who have no opportunity of bringing their own observation to bear upon the flowering of any really valuable collection. During the early months of the year the principal interest in the rock garden arises from the flowering of the various dwarf bulbous plants, of which numerous varieties are now to be seen in cultivation in all parts of the country. Such plants are usually grown in borders, and, as a general rule, many of them succumb to this treatment before the next flowering season comes round. On the other hand, in rock garden compartments they are easily preserved, either by being left to themselves, or by having a few dwarf annuals dibbled on the surface of the compartment over the bulbs as soon as is practicable after the flowering is over and the roots are matured. The bulbs of these plants are generally at such a depth that no injury can befall them. Although I reserve a department of the rock garden entirely for Monocotyledons or dwarf bulbous plants, still a few of these here and there assist in maintaining the general display of bloom until the ordinary Dicotyledonous group begins to flower. The rock-garden at Edinburgh contains 8,000 stone compartments, each varying from 3 to 18 inches in diameter, and, in consequence of the number of spaces, many duplicates of choice plants flowering at the same time are placed at uniform distances apart, and at different elevations. The large extent of surface permits a wide separation of the bulbous plants that are here cultivated; and the use, therefore, of shallow-rooted annuals are not so much required. On the first of May, no fewer than two hundred and fifty species and varieties of dwarf herbaceous and Alpine plants were counted in bloom. By far the most attractive plants at the present time are the numerous varieties of the Ericaceous group; and, just now, we have about sixty plants dispersed throughout the rock-garden of the *Menziesia empetrifolia*, wholly covered with bloom, each plant having an hemispherical shape, and varying from 3 to 5 feet in circumference. A similar number of plants of the *Menziesia coerulea* are also in full flower, varying from 30 inches to 3 feet in circumference. About twenty plants of the *Bryanthus erectus* are also in beautiful flowering condition, varying from 20 inches to 2 feet in circumference, the whole surface of the plants being literally a mass of bloom. *Andromeda fastigiata* and *A. tetragona* are also in full flower, as well as *Erica hybernica alba* and *E. h. striata coccinea*, *Rhododendron Chamæcistus*, *Dryas Drummondii*, and *Azalea procumbens*, with numerous other species of this interesting dwarf shrubby section. At the present time, the *Aubrietias*, of which endless varieties are covered with flowers—the plants hanging down the sides of the rock-garden—are remarkably beautiful. Many varieties of *Primula* are now in perfection, *P. vulgaris rubra*, *P. ciliata purpurata*, *P. japonica*, and *P. denticulata purpurea* being the most attractive. Various other plants, such as the *Dondia Epipactis*, *Pulsatilla bracteata*, *Trillium*

grandiflorum, *Erythronium giganteum*, *Adonis vernalis*, *Schivereckia podolica*, *Hutchinsia alpina*, with numerous other varieties of the herbaceous section, are all freely interspersed over the rock-garden, adding much to its beauty, the colours being so arranged as to give a pleasing effect to the whole. The interest, too, is long kept up by having many of the plants in different exposures, an arrangement which renders it possible to extend their blooming period. JAMES M'NAB.

Royal Botanic Gardens, Edinburgh.

THE WASHINGTON LILY.

SEEING that, by an inadvertence, the wrong Lily had been figured in THE GARDEN for *L. Washingtonianum*, I directed attention to that fact (see p. 343), and evidently it is well that I did so, for Mr. Wilson's remarks (see p. 373) clearly show that there is much confusion respecting it. Mr. Wilson says, "There is this difficulty about the original *L. Washingtonianum*, it was always said to be a most beautiful Lily; this would not be justified by those first imported." Those first imported, however, were only original in the sense that they had not been introduced to this country before, for it is a distinct species, and all collectors and travellers agree that, as seen in its habitat, it is very beautiful. Here it certainly has disappointed us; and the only supposition I can arrive at is that it requires free scope for root action, and must be thoroughly established before it does much good. *Lilium purpureum*, although its bulbs are naturally small, and quite unlike the loosely-scaled ones of *L. Washingtonianum*, produces its flowers very freely when only a few inches high. The bulbs which I imported of *L. Washingtonianum* were found on the Sierra Nevada, in California, 6,000 to 7,000 feet above the level of the sea, where the ground is covered in winter with from 15 to 20 feet of snow. On the other hand, those of *L. purpureum* were found 400 or 500 miles distant, in Humboldt County, on the lowlands near Eel River, where the climate may be said to be that of perpetual spring; and, from the size and shape of its bulb, its habitat, growth, and mode of flowering, it appears to be distinct from *L. Washingtonianum*. I can scarcely understand how Mr. Wilson can call the latter "*Washingtonianum* new species," inasmuch as the *Washingtonianum* of the Sierra Nevada is of itself a species. "In conclusion," says Mr. Wilson, "I should not be surprised if it turns out that we have as many varieties of *L. Washingtonianum* as of *L. canadense*." Of course it is difficult to say what may be discovered; but no traveller or collector that has seen it flowering has yet informed us that it does vary, all those yet met with being of the normal type. It would, however, be extremely interesting if distinct varieties could be found. WILLIAM BULL.

Chusan Palm (*Chamærops Fortunei*).—Permit me to inform Mr. C. M. Hovey (p. 372) that this has fruited here for the past three years, and that it is perfectly hardy there can be no manner of doubt, as it has withstood, without the slightest protection, all kinds of weather since 1867. There are here two plants, 9 feet high and 8 feet through, clothed to the ground with leaves, some of which are 2 feet in width, whilst the stems are 14 inches in diameter, and round these the network of fibrous material is so thick that it is difficult to get near them. Through this mass of matting six immense spathes of flowers are now appearing on each plant, which shows plainly that the past severe winter has had no ill effects on them. They are planted in equal portions of loam and peat, of which they receive every year a top-dressing. When doing this a few weeks ago I had some of the roots laid bare, many of which were as thick as an ordinary-sized walking-stick.—W. WILDSMITH, *Heckfield, Hants.*

Yews and Cattle.—In a paragraph in THE GARDEN (see p. 370), headed "Yews not Poisonous to Deer," it is remarked that "it is imagined by clever observers that sheep and goats can eat Yew leaves with impunity." This statement, though not exactly incorrect, is, I think, calculated to mislead. There is no doubt that all sorts of cattle can, and frequently do, eat the foliage of the Yew with impunity; but, on the other hand, there is ample evidence to prove that at certain times, or under certain circumstances, it is a deadly poison to them. Our experience here is this:—We have lost during the last few years, through eating the foliage of the Yew, a horse, a donkey, a cow, and two or three sheep. The sheep died only last winter, and in their's, and in every other case cited, the cause of death was distinctly proved to be the foliage of the Yew, which was found in their stomachs. I therefore must confess that I consider Yew trees which extend within reach of any enclosures where stock is kept, very dangerous, and can only suggest one remedy, which is to cut them down.—F. S., *Kingston, Derby.*

NOTES OF THE WEEK.

— ALL who have the opportunity of seeing Mr. Jackman's exhibition of Clematises in the Botanic Gardens in the Regent's Park, should lose no time in doing so. Without a visit, it is wholly impossible to form a just conception of the beauty and novelty of the numerous Clematises now shown there. Not a few of them are kinds not yet in commerce, and of the highest merit.

— THE beautiful South African *Greyia Sutherlandi* is now in blossom at Glasnevin; this, and the Botanic Garden, Chelsea, we believe, being the only places in which it has yet flowered. Dr. Moore has succeeded in blooming it by keeping it rather closely pot-bound, and placing it in a very high stove temperature when making its growth. *Cheiranthra linearis*, a curious and beautiful New Holland plant, is also in flower at Glasnevin.

— MR. WILLIAM PAUL has formed a very remarkable exhibition of Roses in the Botanic Gardens, Regent's Park. The whole of the great Rhododendron tent is filled with them, and nearly all of them are unusually fine specimens of their kind.

— MR. GUMBLETON has brought us from Glasnevin a specimen of the lovely *Petræa volubilis*, which is now blooming profusely there. It has large loose racemes of violet and mauve-coloured flowers, the corolla of which is deciduous; the calyx is persistent, and brightly coloured. It is a plant which should be in every garden where means exist for its cultivation. It is a very old plant.

— THE offer of Mr. Albert Grant to lay out Soho Square as a public garden has been declined; but the inhabitants have resolved to remove the dilapidated monument, to enclose the square with new railings, and to lay out the ground in ornamental flower beds. The inhabitants will defray the cost of these improvements, and the square will be kept private, as heretofore.

— THE rare and beautiful *Calypso borealis* is now in flower in the York Nurseries. It is a hardy Orchid from the cold regions of North America, with rosy-purple sepals and petals, and a white tip, heavily blotched with cinnamon-brown. The new Alpine *Kalmia* (*K. glauca* var. *alpina*), which forms carpets about 2 inches high, with charming rose-coloured blossoms, is also in bloom. It has been sent to Messrs. Backhouse by their collector in the Rocky Mountains. *Gentiana verna*, *imbricata*, and *brachyphylla* (from Switzerland and the Tyrol), *Primula Dinyana*, the new and fine *P. Venzai* (in the style of *P. glaucescens*, but with the largest flowers of this section), a lovely pure white dwarf *Caltha* (*C. leptosepala*), from the Rocky Mountains, and the bright dwarf yellow *Ranunculus montanus*, from the Pyrenees, are likewise objects of interest. The new and strange *Echinocactus Simpsoni*, covered with spines like a vegetable "sea urchin," proves to be perfectly hardy, and promises abundant flowers. As a hardy plant, this denizen of the Rocky Mountains will be a new feature in Alpine rockeries.

— WE ought, perhaps, to point out that the plant exhibited by Mr. E. Wrigley, of Bury, some time ago, and also by the Rev. Mr. Norman, under the name of *Odontoglossum maxillare*, is not that species, but *O. madrense*. *O. maxillare* of Lindley is a membranaceous-flowered plant, nearly related to *O. Rossii*, *O. membranaceum*, or *O. Erenbergii*; whereas *O. madrense* is allied to the *O. cordatum* of Lindley, or the *O. maculatum* of the "Botanical Magazine." The pseudo-bulbs are sub-cylindrical instead of ovoid, and the spikes bear from five to six snow-white flowers of wax-like, almost leathery, texture, the sepals and petals being blotched with rich chocolate-purple at the base. The lip is cordate, having a bi-lobed crest blotched with lemon-yellow, and mottled with orange. This plant has recently been figured in the "Botanical Magazine," and also in the "Floral Magazine," under the name of *O. maxillare*. It has recently flowered freely in Messrs. Veitch's collection, where its delicious Almond-scented flowers lasted from five to seven weeks as fresh as when they opened.

— A VERY liberal schedule has been issued by the Leeds Horticultural Society for its exhibition in June next, and many inducements are held out to exhibitors to take part in the contest. Amongst the prizes offered in a few of the principal classes are the following:—Twelve stove and greenhouse plants in bloom, £20, £12, £8; twelve Roses in pots, £20, £12, £8; twenty Roses in pots, not more than 9 inches in diameter, £10, £6, £4; twelve *Pelargoniums*, £12, £8, £5; twelve Orchids, £12, £8, £4. Classes for fine foliage plants, Ferns, hardy and exotic Azaleas, Heaths, Fuchsias, fancy and zonal *Pelargoniums*, and cut Roses, receive most liberal prizes, as well as fruits, both in collections and single dishes. The Society finds horses, free of cost, to draw exhibitors' vans to and from the railway to the exhibition ground, and large roomy vans for those who take their plants in railway trucks. This is a great boon to exhibitors, who are generally victimised by the exorbitant demands made upon strangers for removing their plants at such times, and when they are powerless

to resist it. The Society also finds men to assist in the removal of the plants to and fro.

— THOSE interested in late-keeping Apples may like to know that the best flavoured of those now in Covent Garden is the Sturmer Pippin.

— THE new garden on the Thames Embankment will be opened this day, by W. H. Smith, Esq., M.P. It was designed by Mr. Vulliamy, and the work carried out by Mr. Meston.

— A NEW and improved edition of "Alpine Flowers for English Gardens," published by Mr. John Murray, is now ready, and a companion volume with coloured plates is in preparation.

— MR. ROPER, President of the Eastbourne Natural History Society, has just completed a "Flora of Eastbourne: being an Introduction to the Flowering Plants, Ferns, &c., of the Cuckmere District—East Sussex." The volume will be published by Mr. Van Voorst.

— THE small Carrot figured last week in THE GARDEN is now being sent in abundance from Paris to the London and other English markets. Vast quantities of Asparagus have lately arrived, and Lettuce is yet brought over in quantity. All these come from the Paris gardens.

— THE Central Horticultural Society of France announces that its annual exhibition will not be held in the usual place, the Palais de l'Industrie, this year, but in the Orangery and surrounding grounds of the Tuileries. It will be opened May 29, and closed June 6, and will comprise horticultural products generally, as well as garden implements, &c.

— THE introduction of every kind of plant, no matter what its nature or origin, is forbidden in Italy from the 18th of May. This is, no doubt, done from dread of the Phylloxera; but what a fatal obstacle to the progress of horticulture! The importation of American Potatoes, and of the sacks or cases in which they may have been packed, has also been prohibited at all the ports of Russia and Finland.

— A NEW Snowdrop (*Galanthus Elwesii*) is figured in the last number of the "Botanical Magazine." It is a native of Asia Minor, where it was collected, on the mountains near Smyrna, by Mr. Elwes last year. It bloomed this spring, and is thought to be distinct, though it bears considerable resemblance to *G. plicatus*, a name under which it was distributed some twenty years ago. It, however, differs in several respects from that kind, and is a good addition to our early-flowering hardy border plants.

— AT a recent sitting of the Central Horticultural Society of France M. Andry, in alluding to the death of the late M. Lucy, remarked that the latter was the first to recognise the peculiar merits of the Gloire de Dijon Rose, after it had been obtained from seed by M. Jacotot, who scarcely noticed it amongst many others. M. Lucy advised him to propagate and send it out, which was done, and the result has been that a most valuable variety has been added to our list of Roses.

— VINE culture in New South Wales is progressing very rapidly, the number of acres occupied for this purpose being 3,183 in 1873 against 2,568 acres in 1872, and the produce 575,985 gallons against 451,450 gallons. These figures relate only to the growth of Grapes for wine-producing purposes, but a considerable area is devoted to the cultivation of the Vine for other objects. In Western Australia also, where the soil and climate are eminently favourable to the growth of the Grape, this pursuit is becoming more general.

— MESSRS. THYNE'S very extensive and richly-stored new winter gardens at Glasgow were opened with some ceremony last Saturday. They are in the extreme western suburb of the city, and from the commanding terrace on which the principal houses are situated a magnificent view is got of the Campsie and Dumbartonshire hills, while in the immediate foreground is a beautiful artificial lake. The general plan of the garden is somewhat similar to that of Messrs. Veitch at Chelsea. The frontage extends 300 feet, and the space on which glass houses are erected is very extensive. Fronting the greenhouses is a fine terrace, 25 feet wide, planted effectively with Limes, Elms, Poplars, and the choicer Coniferae. A broad avenue of Coniferous trees divides the gardens into equal portions. Facing the west and parallel with the roadway are two conservatories, each 60 feet in length—one for stove and the other for greenhouse plants. At right angles to the conservatories are the Heath and show-houses, each 60 feet long, with glass pits of a length corresponding with that of the houses and forming, as it were, aisles to the main buildings. Parallel with the conservatories are six ranges of houses for propagating and forcing purposes, or for the display of exotic Ferns, the prettier sorts of foliage plants, Geraniums, &c., while the right and left of the whole establishment are occupied by a large Azalea-house and a cool Fernery—the latter especially being charmingly laid out.

THE GARDEN IN THE HOUSE.

CYCAS REVOLUTA FOR WINDOW RECESSES.

THOUGH we have long been familiar with this Japanese Cycas, it will, I think, be admitted that it is still one of the handsomest species in cultivation. When in full health and well-grown, with several tiers of beautiful fronds rising one above another to the latest-formed growth, standing almost erect in the centre, it is a very handsome and striking object indeed, and inferior to few, if any, fine-foliaged plants, either for exhibition or house decoration, though only well adapted for the latter purpose when the plants are young. Plants about one year old from corms, with one set of leaves about 2 feet high, fit single window-cases exceedingly well, the surface of the base being covered with *Lycopod*. No Fern that I know of can match a plant of this size, with its symmetrically arranged and erect, yet gracefully recurved, leaves, in a window-recess, half-hid by the folds of a lace curtain. To have plants of this description is in the power of anyone in possession of a somewhat old plant. If they will search under the soil about the base of the stem, they will discover perhaps from six to two dozen corms, about the size of Cocoa-nuts. If these are detached and potted singly in well-drained pots, and in tolerably rich soil, with the crown of the corm just peeping above the surface, and plunged in a moist stove with a bottom-heat of 80° or 85° about this season, they will start readily into growth, and form handsome little plants by autumn, and, if desired, they may be kept at this size for several years. I say desired, for, when they form the second and third set of fronds, the first fall down more, and the plants are then not so well adapted for decorative purposes, as the spreading foliage interferes too much with surrounding objects, and is otherwise in the way. In roomy spaces, and in front of halls, &c, they, however, do well enough. I took eighteen such corms from an old plant three or four years ago, grew them as I have stated, and we have most of them still with the original set of

leaves only; but they are now getting rather shabby and mutilated, and will have to be encouraged to make another growth this season, if all is well. They have been kept in this condition purposely by plunging them in a sub-tropical bed out of doors during summer, and wintering them in a cold greenhouse, which has prevented them making growth. When large specimens are desired, the plants should be grown in the stove and shifted forward liberally—for they are great rooters—using a substantial compost consisting of turfy loam, peat, and sand, and well-rotted manure, taking care to crock the pots carefully, and to water freely when the plant is growing. The

plant is very liable to brown scale—at least, in a warm stove—and, if this pest be not checked, it spreads with amazing rapidity on the undersides of the leaves. Soap and water and a brush are the proper correctives. A somewhat aged plant which we had here at one time, but which was exchanged for more useful stock, flowered twice in the course of a few years—I think, within three years. When sent away, it had two rings of empty seed-husks hanging round the crown. The flower, if we can call it such, is like an immense drab corona in the centre of the leaves, and sadly interferes with the shape and growth of the plant for the time being. Both *C. revoluta* and *circularis* are great ornaments in our plant houses. They are popularly, but erroneously, called Sago Palms; as they furnish none of the Sago of commerce.

J. S. W.



An Easily-arranged Plant-stand.

The pith of the stem of *C. revoluta*, however, abounds in starch, which is highly esteemed in Japan.

PLANT STANDS.

As regards the best mode of arranging flowering or foliage plants on stands for effect, there are many opinions; but one of the most important points for consideration is the time occupied in that kind of work. Many do not mind devoting half-a-day to the embellishment of the dinner-table, or to the arrangements of a bouquet; but gardeners, as a rule, can scarcely afford such a loss of time, especially where (as is now frequently the case) they have to furnish, not only plant

stands, but drawing-room vases, and make bouquet and coat flowers nearly every day in the year. Much time, too, is wasted in the arrangement of vases and tazzas, simply because no definite idea is formed beforehand as to the effect required; therefore, the plants are shifted and re-arranged in a hundred different ways to "see how they look," whereas a few minutes only should be devoted to such work. The accompanying illustration represents a bronze tazza, ornamented with well-known decorative plants. The margin is fringed with *Isolepis gracilis*, used expressly to tone down the harshness of the metal work. Two or three plants of the Palm-like *Carculigo* are placed in the centre; and these, by furnishing bold and graceful foliage, contrast well with the horizontal lines of the tazza below, while their cool and deep-toned greenness forms a pleasing contrast to the character of the stand itself. Heaths, too, and similar hard-wooded plants are added, and with good effect. F. W. B.

CULTIVATION OF WATER-CRESSES.

It appears that it was in the environs of Erfurt and of Dresden that the cultivation of Water-cress was first carried on to a large extent; but M. Cardon, seeing what was done with it in Germany, afterwards established its cultivation in the Valley of La Monnette, near Senlis—a species of industry for which the Horticultural Society of France awarded him its large silver medal. He sought for a soil watered by springs of running water, and, after a long search, he found, in 1811, at Saint-Leonard, in the valley just named, a piece of level ground of about 12 acres, which appeared to offer all the required conditions. Here he prepared numerous trenches for this Cress; some were at Saint-Firmin and others at Saint-Gratien. The elder Billet formed a number at Villemetry, as well as at Baron. The impulse to Cress culture being thus given, so many took part in it that, in 1835, large quantities of ground were occupied by it. The demand for it, however, had increased even faster than its production, and, therefore, new plantations were soon added to those just mentioned. These were established in 1843, at Gonesse, under remarkably favourable conditions.

Choice of Situation and Water.

Very sandy ground should never be chosen for the growth of Cress, because it lets the water escape by filtration, both through the sub-soil and through the belts of earth which isolate the trenches; chalky soil should also be rejected, because it does not furnish to young plantations the aliment suitable to them. The best soil for Cress is clayey loam, and what is said under this head applies, it will be understood, less to the surface properly so called, than to the bottom upon which the plantation rests. Nevertheless, the surface itself should be studied to some extent where trenches are employed, and the more level the ground is the better. The character and temperature of the water, as well as the amount of it, are also important considerations for the Cress grower, inasmuch as unsuitable water affects the quality of the crop. With abundance of water Cress produces large leaves of a fine green colour all the year round; while, with insufficient water, the plants grow weakly, the leaves are small, and are often burnt by heat in summer and frozen in winter. The mistake of most Cress growers is the desire to have more trenches than they can supply with water. Each trench requires 6 inches of water per minute. The Cress beds of Gonesse receive 7 inches of water per minute, which is equivalent to 3,700 gallons of water for 190 trenches, and there should be an out-flow for each trench, which, in times of drought, and in winter, should be reduced to a half, or even to a quarter, of what it is at other seasons, so as to ensure plenty of water in the trenches, as it is during the intense heat of summer and in winter that the plantations are in danger of perishing from want of water. Proximity to the source of supply is likewise an all-important consideration in the establishment of Cress plantations. If the source is too far off, its waters get heated in summer and too cold in the winter before they reach the beds, which, in severe winters, become frozen and perish. The necessity of having Cress beds as near as possible to the spring to some extent limits their length, but where it is absolutely necessary to establish trenches far from the spring, the water should be led to them in covered drains or canals, which will help to keep it warmer than it otherwise would be, and the deeper the spring the higher the temperature. The water of artesian wells is comparatively warm, but it is not the best for our purpose, nor should recourse be had to the water of small rivers—which are in reality but water from distant sources—except in cases of absolute necessity; and care should be taken not to mix it with that of the springs which supply the plantation. The chemical character of the water destined to supply Cress beds, too, should not be altogether overlooked. For example, some field waters communicate to

the Cress a marshy flavour, and load it with a yellowish deposit, and they are too warm in summer and too cold in winter. Water charged with carbonates of chalk and magnesia encrust the Cress, and should be avoided, as should also what is termed hard water, but ferruginous water is good, both as regards our own health and that of vegetation—a fact proved by the fine state of the beds at Gonesse, and above all at Duvy, which are supplied by water containing a very appreciable quantity of iron. Water, overcharged with iron, however, impairs the growth of the Cress, and contaminates it by an ochreous deposit.

Formation of Trenches.

The locality, soil, and water supply having been determined, the next thing is the formation of the trenches, their declivity, length, breadth, and depth. Experience has shown that the most convenient gradient is that of 5 inches to 260 feet. The length of the trenches is necessarily limited, in certain cases, by the extent of the grounds themselves; but, where there is room, from 260 to 270 feet constitute suitable lengths. If too long, the trenches do not receive the water running sufficiently briskly or fresh enough in summer, or warm enough in winter. Therefore, short trenches are, upon the whole, the best. The breadth to be given to such trenches, too, ought not to be a matter of indifference. If they are too broad, currents are often produced at their sides, or in some parts of their interior, leaving the rest of the trench a swamp, owing to the non-renewal of the water; a thick regular plantation, however, in some measure prevents the establishment of currents. In large trenches the flow of water is generally sluggish—a circumstance which not only enfeebles the plant, but produces a sort of marsh Cress, instead of spring-water Cress, which we require. Large trenches are more difficult to work than smaller ones, and they are more exposed to heat and cold—first, because of insufficient shelter; and, secondly, in consequence of the slower current of the water. Narrow trenches, on the contrary, produce a very fine Cress; they have, however, in practice, the following inconveniences:—They occasion a considerable loss of ground owing to the multiplicity of separation banks, the manure is drained off too speedily, and the isolation of the plants is interfered with; therefore, the breadth generally adopted is that of from 10 to 12 feet; it should not exceed 13 feet, and trenches of this width should not be adopted unless the supply of water is very abundant. The depth of the trenches necessarily depends upon the level of the springs; but, if too shallow, the Cress cannot be flooded; and, if too deep, isolation is diminished, and cutting is carried on under difficulties. If we consider that it is necessary to give the trench 4 inches of water, above which the Cress will be able to elevate itself from 6 to 8 inches, and that it is necessary that the walls of separation should serve for shelter, we come to the conclusion that the most convenient depth is from 18 to 20 inches. Between the contiguous trenches the earth dug out is often left; but as, in this way, too great an elevation is given to the walls which separate the trenches, it is better to remove the earth, and spread it on the neighbouring fields. The trenches should be parallel to each other, the top and bottom of each being placed, as much as possible, near the canals of supply and discharge. The bottom of the trenches should be well dressed or levelled, and put under water a few hours before planting. Each Cress plantation—that is to say, each series of parallel trenches—should have a common canal of supply to bring the water to it, and a canal of discharge, into which the water should flow upon coming from the trenches. The supply canal should run along the head of the trenches, and be connected with them by means of a single earthenware pipe, through which the water should pass equally to each trench. The dimensions, too, of both canal and pipes should be such as to enable the operator at any time, say during frost, to double or even, if requisite, treble the supply of water, which should always be sufficient for such purposes, or the crop will be a comparative failure when its marketable price is the highest. The outflow water is generally lost; but, charged with manure as it is, it might be profitably used for purposes of irrigation.

Planting Cress.

The months of March and August are acknowledged to be the most favourable times for planting; but in August fresh plantations should chiefly be made, as then the summer crops can be cleared off by taking up the plants, and no important stoppage takes place, as the parent trenches soon refurnish themselves with fresh Cress; while, in March, it takes much longer to repair the gaps made in the mother-trenches, and the new plantations are much slower in affording a crop than in August. There are cases, however, in which it is imperatively necessary to plant in March, as the beds often get destroyed in winter by frost. The bottom of the trenches having been previously moistened as already directed the planting is conducted as follows:—The Cress is thrown down in little tufts, at

distances of from 3 to 4 inches apart, beginning at the head of the trenches and finishing at the bottom. The arrangement is as much as possible in tranverse rows, the plants being put in in quincunx fashion, with their tops inclining towards the head of the trenches, that is, towards the source of the water, which assists them in righting themselves. It will thus be understood that the tops of the stems of the second row rest upon the roots of the first, those of the third upon the roots of the second, and so on to the end. The Cress readily attaches itself to the moistened earth, and after four or five days will have recovered itself, when it is immersed in 2 inches of water; five or six days after, that is to say, eight or ten days after the planting, it is pressed down with an instrument called a "schüele;" and, lastly, the trench, when the plants have acquired a certain height, receives all the water which is destined for it. It has been ascertained by comparison that the time for the first cutting is accelerated by about eight days, if, instead of throwing the Cress upon the bottom of the trench, it is properly fixed in the ground. Where the mud in the bottom of old beds needs cleaning out, and where the plants are not wanted for forming new beds, if the trench is thickly furnished with healthy vegetation, all that is required is to begin at one end and roll the Cress up as one would a carpet, clear out the bottom, and replace the Cress on its old bed. This being done, the water is admitted, and three days afterwards the Cress is dressed, and pressed with the "schüele" and the roller. This plan of renewing the beds is not only economical as regards labour, but has the advantage of not retarding the cutting, which, under the ordinary method, is otherwise thrown back nearly a fortnight. A plantation may be established by sowing Cress seeds, but this process is much slower than that of using portions of the plant. If recourse is had to seed it would be requisite, after having withdrawn the water, to sow upon the mud spread over the bottom of the trench; but few Cress growers would adopt this plan.

Cutting or Gathering Cress.

To gather Cress a man having his knees protected by thick knee-caps covered with strong leather kneels upon a plank thrown across the trench; with the left hand he seizes a handful of Cress, which he raises a little towards him, and with the right hand cuts it with a knife. When he has collected as much as will form a bunch he ties it with a twig of osier, of which he carries a small bunch at his girdle, clips off the too salient roots, throws the bunch into water under the shade of the embankment, and again commences the operation. A first-rate Cress cutter often cuts three bunches per minute, or 1,440 per day of eight hours; but he is reckoned a good workman when he can do two bunches per minute or about 1,000 bunches per day. At Gonesse and at Duvy the bunches are collected in covered pans, which traverse the water of one of the supply canals. Each bunch of Cress is about 6 inches long, 9 or 10 inches in circumference, and weighs about 18 dwt. The retail dealers of Paris generally divide them. Instead of cutting the Cress completely bare, they take only half or a third of the shoots, leaving the rest to be rolled on the bottom of the trench into which it pushes fresh roots and grows with increased vigour. The operation of cutting Cress being very fatiguing, in consequence of the inconvenient position which the workman is obliged to assume, the length of the day's work is usually fixed at eight hours. After each gathering of Cress the trench should have a good manuring and rolling.

Manuring, Spreading, and Rolling the Cress.

After each cutting the trenches are well manured by introducing it between the stems of the plants, and also by disposing of it in tranverse layers pressed tightly with the "schüele." The manure preferred is well-rotted cow dung, which is introduced into the trench between the plants, and is rammed in with the schüele, an implement consisting of a thick board several inches broad, and half the breadth of the trench in length, fixed obliquely to a long handle. Two workmen, walking opposite each other upon each side of the trench, with this ram in the manure, an important operation, which has for its object the fixing the dung about the roots of the plants, and thus preventing the mud of the bottom of the trench from soiling the green and marketable parts of the crop. This kind of manuring resembles, in some respects, the mulching of Strawberry beds. After the use of the schüele comes the rolling; this is done with rollers of a particular kind, furnished at their extremities with long handles, and drawn by workmen who walk upon the edges of the walls or banks that separate the trenches. This thoroughly fixes the manure in its proper place, and replants the Cress that had been raised in the operation of cutting, pressing the stems down in such a manner as to cause them to produce new roots, thereby increasing their vigour and adding to the quality of the produce. It was at one time a widespread practice to submerge

the crop during a great part of the winter to keep it from cold, but this has been found to deteriorate its quality both as regards colour and flavour. After rolling the plants in the trenches are all of one height, a condition which they retain until the next cutting. If a hole shows itself in this verdant carpet it is immediately filled up by throwing in some handfuls of Cress, which are pressed in with the point of the schüele. A little insect called the altise (*Altica sysymbrii*), often designated by the names of flea or tick, causes great injury to Cress in dry summers, attacking the old stems and perforating the leaves. This is, however, easily destroyed by temporary submersion of the trenches, and the dead insects are removed by means of rake-nets made of coarse linen. Water weeds are also often troublesome, and must be persistently removed.

Duration and Renewing of Cress Plantations.

In all well-worked Cress Plantations the trenches ought to be renovated every year, and it is very rare even in the case of tuft-planting, much less that of the carpet plan, that a single cutting is lost. Whenever decay shows itself, the plantation should be renewed immediately. The Cress is then torn up by the roots, and deposited on the bank which separates the trenches; but it ought to be stated that the method of rolling it up like a carpet, already described, is more expeditious, inasmuch as in this way growth is hardly suspended. When the Cress has been deposited upon the sides of one bank, the mud and detritus at the bottom of the trench is thrown upon the other, and thus all the trenches are renovated, care being taken to deposit the Cress and the mud in such a manner that the work may be carried on effectually and economically. The mud should be afterwards carted away. Vegetables are sometimes grown upon the banks; but their presence there impedes the proper working of the trenches. This objection, however, does not apply to Grass of which hay could be made. Sometimes, too, when Cress is unusually cheap, the water is drawn off the trenches themselves between May and August, and they are planted with light crops which yield a better return than the Cress. April and May are the months in which Cress grows fastest, and if the season is warm it must be often cut to avoid flowering; but all through the summer Cress still grows strongly, and yields abundant produce if properly planted and well supplied with water. Shade has been suggested by means of plantations of Osiers, Poplars, or Willows; but, in autumn, the leaves which fall into the trenches soil the crop. Besides, Cress can well withstand heat, provided it has plenty of fresh running water as has been already stated. The month of August is preferred to that of March for the formation or renovation of Cress plantations. In summer Cress plantations come to a stand-still, where the amount of water is insufficient, or where the plantation is established upon a turfy soil, and when it is too far away from centres of consumption. Winter is the season most dreaded by Cress-growers, as on it depends their profit or loss. In winter good prices are obtained, but frost often overtakes the trenches and stops the supply. Warm water—that is to say, from springs very near the trenches, which are sufficiently abundant to establish a rapid current—is what will save Cress beds. If the cold is sharp—and yet there is no fear of the water freezing—it must be so arranged that it only just covers the tips of the sprouts of Cress. But, if the cold is more intense, and the water is cold and insufficient in amount, the trench must be flooded in such a manner that the surface of the water rises above the Cress to the full extent of the thickness to which the layer of ice is likely to attain. As soon as a thaw takes place the ice should be broken and thrown upon the bank, and the level of the water lowered by degrees. Cress is sent to market in open wicker-work hampers. In the centre, or between the heads of the bundles of Cress, which are placed all round the hamper with their roots leaning against the sides, is fixed a shaft, which gives free passage to the air; twigs of Osier keep the bunches in their places, and prevent them from slipping into the ventilating shaft. If from any circumstance the transmission of the Cress to market is delayed, the bunches must be immediately untied and the Cress thrown into water and well shaded from the sun.

Uses of Cress.

Cress, as most people know, is principally consumed in its raw state. On the Continent, it is served up round roast and boiled meats, to which it serves as a condiment. Raw Cress is easily digested; a fact explained by the active properties which the plant possesses, and by the delicacy of the tissues. In this last respect, the cultivated plant, and, above all, that from well-kept plantations, is infinitely preferable to the harder, more bitter, and less frequent wild plant. Boiled Cress, prepared like Spinach, is often eaten, and is sweet and agreeable. It might, in fact, be called Cress-Spinach; and, being cheap in summer, might be used as a substitute for that vegetable. A good soup is sometimes prepared from Cress at the

Café Riche, one of the best restaurants in Paris. The employment of Cress in medicine is as ancient as the virtues attributed to the plant are numerous. The Romans knew it, and made use of it. It stood in the first rank in the Arabian pharmacopœia. But it is in modern times that it has been most appreciated. Cress is affirmed to be one of the best anti-scorbutics, and also to be eminently purifying and dissolvent. It is given to persons who have weak constitutions, and in cases of chest diseases, particularly incipient phthisis. Its juice is sometimes used as a gargle, and with good results. It may be added that Cress off ferro-iodinic waters ought to be most sought after, inasmuch as it possesses, in a greater degree than ordinary Cress, two valuable constituents—iodine and iron. We cannot, therefore, say too much to induce persons having at their disposal streams of this kind to utilise them by the formation of Cress plantations.

THE INDOOR GARDEN.

ON RAISING FERNS FROM SPORES.

THE propagation of Ferns from spores is, in general, very imperfectly understood, and this is more especially the case with species belonging to Gleicheniaceæ, Marattiaceæ, and Hymenophyllaceæ. The spores of some species vegetate very freely, and no difficulty is experienced in obtaining a stock of them; while others are less easily managed, and are, in consequence, much rarer. Mr. Mayer, of the Carlsruhe Botanic Gardens, has devoted special attention to this branch of cultivation for several years, and he has recently published the results of his experience in the "Gartenflora," the main points of which are given in the following remarks. The principal things to be considered in raising Ferns from spores are—selection of spores, time of sowing, pricking out of the young plantlets and protecting them from the numerous attacks of insects, Funguses, Algas, Mosses, &c. With regard to the choice of spores, ripeness is of the first importance. The presence of spores on a living plant or dried specimen is readily determined, and a lens of low power is sufficient to distinguish them from the spore-cases, surrounding hairs, &c. The spores of certain genera may be known by their colours, but farther than this, except with a very high power, it is impossible to go; hence, the necessity for great care in naming the spores at the time they are collected. To ensure, as far as possible, the presence of fertile spores, they should be taken from the most fully-developed part of the frond on which the spore-cases are just beginning to open; the portion of the frond bearing the spores should be detached from the plant and packeted in good paper, and the spore-cases will soon open and discharge their contents. This mode of procedure is more especially to be recommended in the case of those Ferns whose spores lightly float out, as it were, when the case opens, such, for example, as Angiopteris, Marattia, Gleichenia, many Cyatheaceæ, all of the Hymenophyllaceæ, and in *Todea superba* and *T. hymenophylloides*. To the foregoing might doubtless be added all those Ferns which grow naturally in a humid atmosphere, and are at all times more or less saturated with moisture. The question arises whether these Ferns can be raised in the ordinary way by simply scattering the spores over the surface of soil, as is usually done with most other Ferns. The conditions under which they are found growing naturally, and the experience gained by practice, teaches us that, if not impossible, it is at least very improbable. Ferns of this nature furnish fertile spores only when they are ready to fall direct from the mother plant on the medium (soil, turf, Sphagnum, &c.) on which the vegetative process and further development can take place. As soon as the spores have attained maturity, and before they fall from the plant, the first stage of vegetation sets in, hence the chances of success are much greater if a prepared surface is arranged immediately under the mother plant. As a matter of course, any interruption, however slight, of the vegetative process would deprive the spores of their vitality. As a proof of this statement, we may mention that we have never in a single instance succeeded in raising Ferns of this class from spores taken from dried specimens, whereas we have seen not only the prothallium, but also frondlets, on the fronds of the mother plant, as well as on the surface of the soil around and under it. Furthermore, it may be added that the material (with the exception of *Hymenophyllum Tunbridgense*) used by Weltenius in his "History of the Development of the Hymenophyllaceæ" to illustrate the germinating spores and the origin of the prothallium, was all taken from dried specimens. With regard to the best time for raising Ferns, the winter should be chosen, although any other time would do as well, because they require a great deal of attention, and at this period the gardener has most leisure. Very much patience and time must often be expended before the cultivator

has the pleasure of seeing his labours rewarded with real results. It is not necessary to insist here upon an uniform temperature, a constantly humid atmosphere, and subdued light—conditions most easily obtained in the winter season, when the plants are young and tender. The spores should be separated as much as possible, and not sown very thickly, otherwise it is difficult to part the young plants, and they have to be pricked out in bunches at first, and afterwards, as they grow larger, parted again and again, until they are singled out, an operation that greatly endangers the roots. Except for tree Ferns, or rare species, it is not of very great importance to have single plants. When pricking out, it is desirable not to have the young plants longer than is absolutely necessary in the drier atmosphere of the potting-house. One of the most difficult tasks, which has already been alluded to, is to protect the prothallium from the depredations of insects, Funguses, &c. The difficulty is not alone in the delicacy and tenderness of the plants themselves, but rather in the slow rate of development from the spore to the formation of the fronds, which, in some instances, occupies several months. Of course, the more extended the period of development, the greater the dangers of invading liver-worts and other rapid-growing Cryptogams; and herein may be sought the cause of the disappearance of many beautiful Ferns, not easily propagated in any other way. The interval between the germination of the spore and the formation of fronds is naturally the most precious period. The length of time spores lie before germinating depends upon a variety of circumstances, such as age of the spores, the temperature to which they are exposed, the temperature of the water with which they are moistened, &c.—points very difficult to ascertain and fix in the degree most favourable for different species. A long series of observations and comparisons can alone settle these questions. As already stated, the most successful results are furnished by those species which develop fronds from the prothallium in the shortest time. It will be observed that sowings of such genera as *Gymnogramma*, *Cheilanthes*, *Ceratopteris*, *Notholæna*, *Pteris*, &c., are almost always attended with favourable results, while success is much more uncertain with many tree Ferns, and the genera *Acrostichum*, *Lygodium*, *Davallia*, *Gleichenia*, &c. But now for the best means of removing or lessening the many dangers which beset Ferns in their earliest stages of growth. The first and most important thing to do is to extirpate, as thoroughly as possible, all vegetable and animal life inimical to the well-being of young Ferns, in the place where it is intended to attempt their propagation, and particularly to prevent their breeding or fructification. The peat, or other material, in which the Ferns are to be raised, should be previously baked or soaked in boiling water, and used immediately after this operation. It is also inadvisable to do the work of preparing and sowing the Fern spores in a place where there is any chance of spores of other Cryptogams floating about in the air, and least of all in a Fern-house. We know gardeners who will scarcely be convinced that the spores of Ferns do not sometimes produce something totally different from the mother plant. It is a fact that a crop of some common *Pteris*, *Gymnogramma*, or *Aspidium*, often, indeed usually, spring up where we expected something quite different; but the explanation is not difficult when we remember that the air of a Fern-house is more or less pervaded with the spores of these free-fruited, rapid-growing species. Under such conditions, the species of less rapid development are almost certain to be displaced or choked; but, with every care, it is impossible to effectually exclude all foreign spores and germs, which are conveyed partly by the air, and partly in the rain-water used for sprinkling. In the case of species of slow development, it is a good plan to prick them out afresh two or three times, according to circumstance, using each time soil prepared in the manner already indicated. The floor of the pit or box, of whatsoever it may consist, in which the pots containing the spores are placed, should also be soaked with boiling water. Insects, and other injurious little animals, may be killed or driven away by fumigating with tobacco-smoke. To the foregoing general remarks we will append a few special observations on the propagation of the genera *Marattia*, *Gleichenia*, and *Trichomanes* from spores. We are well aware that these observations are incomplete, but they may afford the cultivator some clue to the successful increase of these attractive plants, and thus become instrumental in their wider distribution in gardens. Among the Marattiaceæ, we were not only successful in bringing the spores to germination, but also in raising a considerable number of plants of *Marattia latifolia*. What has already been noted with regard to the ripeness and collection of spores applies with especial force to the Marattiaceæ. The spores of species in question lay four weeks from the time of sowing till the first development of the prothallium, and four more weeks elapsed before it was large enough to prick out; but from this time forward from six to eight months, and in some cases

even a longer time passed before the first frond was produced. Instead of forming fronds, the prothallium spread out very widely, and the experiment of cutting it up was tried, care being taken to leave one of the deeply-cut bays on each piece, as the first fronds always appear on or near the deepest part of such an indent. The result was surprising, for in from four to six weeks nearly all of the pieces had produced their first fronds. The relatively rapid development of fronds was the effect of cutting up the prothallium. In the *Gleicheniaceæ* success attended the experiment repeatedly tried with spores of *Gleichenia dicarpa*, and numbers of plants were raised. Spores of other species could not be procured, which is probably the principal difficulty in the way of raising them from spores. The prothallium of *G. dicarpa* was just five months from its first appearance before it produced a frond, and, therefore, it was

plant of dense habit, and one which bears enormous trusses of brilliant orange blossoms, with which its glossy fresh green foliage forms a striking contrast. As an exhibition plant, it must soon become a general favourite. The stock of this charming addition to this handsome genus—in which we have now oranges and scarlets of the most brilliant description, as well as whites of the purest character—has been bought by Messrs. E. G. Henderson, of the Wellington Road Nurseries, St. John's Wood, and will be sent out some time during the forthcoming season. B.

How to have *Rondeletias* in Bloom in September.—How am I to have *Rondeletia speciosa* in flower in the beginning of September? The plant is at present in a stove, which is kept at



Fraser's Ixora (*I. Fraserii*).

necessary to prick them out several times. Repeated experiments were made with the *Hymenophyllaceæ*, both with spores from dried specimens and direct from living plants; but not one succeeded, though the prothallium of a *Trichomanes* was observed on and beneath the fronds of *T. attenuatum*. Its development could not, however, be followed up. H.

FRASER'S IXORA.

(*I. FRASERII*.)

THIS fine stove shrub, which is undoubtedly one of the best of the orange-flowered *Ixoras*, formed part of a batch of seedlings raised by Mr. Fraser, of the Lea Bridge Nursery. It was first exhibited at South Kensington, in July last year, when it was deservedly awarded a first-class certificate. As will be seen by our illustration, it is a

about 65° at night, and where it has made growths about 6 inches long; therefore it will be in bloom before the time mentioned.—A SUBSCRIBER. [*Rondeletia speciosa*, when in good strong condition, will generally flower twice during the summer, the second time in September; but, to ensure the second blooming by that time, the plant must be started early, say in the beginning of February, in a night temperature of 65°, with a rise, as the days lengthen. A plant, in the condition just described, is, I fear, not early enough to produce a second crop of flowers by the time required, and the first will most likely be over. I should recommend pinching out the points of the shoots now, an operation which, if the plant is strong, will cause it to break in a double manner, producing thereby a proportionate increase of bloom. If, after this, it should form its flower-buds too soon, it will bear during the summer being kept at the warmest end of the greenhouse; but the flowers of this plant like a considerable time to open after they are formed.—T. BAINES.]

CULTURE OF MASDEVALLIAS.

THERE is no more beautiful tribe of Orchids than the various kinds of Masdevallia. They combine somewhat of the grotesqueness of the Orchid family with, in some instances, gorgeousness of colouring. Until within these last few years they appear to have been little known, but what with the improved modes of packing and the rapidity of transit to this country, together with the cool treatment which is sensibly appreciated and acted upon, they appear now in something like the beauty which they display in an indigenous state. Dear they are to buy certainly, but once on the right road of proper culture they more than repay the investor. So far as can be seen, the high prices once obtained for them must in time give way, although the best varieties are always sure to realise full market value. The question now with anyone concerned with Orchids or in Orchid culture, is not so much the possession of a particular species, as of a first-rate variety of that species. Like Amaryllids and other choice plants, some varieties may not be worth as many shillings as others may be worth pounds—the one you look upon as a weed the other as a gem. Regarding the culture of Masdevallias, it may help some of your readers if I state that, when properly in hand, they are the most facile of Orchids to encourage towards strong growth and prolific flowering. Some species may be grown too strong for a proper state of inflorescence, such as Vandas, Aërides, and similar kinds; but you may cultivate Masdevallias with all the luxuriance it is possible to create, and yet they will flower and continue to flower, and always with corresponding vigour. You cannot do this, however, without placing the plants in a proper temperature, which means that it should be moist—much moister than many Orchids will bear; it must be cool—much cooler than for the majority of even cool Orchids; and it must be toned down from the pressing and exhausting influences of solar heat, or there can be no success worthy of the name. One is accustomed to see leaves looking bleached at the extremities; this is caused by excessive heat and a deficiency of water. Properly cultivated Masdevallias should not have this appearance any more than properly cultivated Odontoglossums should have leaves of the texture of silk paper, which fall by their own weight. He who does not get over this defect has something to learn in the cultivation of the most beautiful of the many beautiful tribes of Orchids. Some of the families look shabby at certain periods of the year, and yet are in a good state of cultivation notwithstanding their defective appearance,—as Cattleyas, for instance, that require a thorough ripening of pseudo-bulbs to yield the best quality of flowers; but the plants in question are not healthy if they are not always green. There is no great difficulty in ensuring that this shall be the case; but they must be kept cool and moist near the glass, and, moreover, in a healthy feeding medium. Their white larva-like roots show the experienced cultivator that they require something of the richness of ordinary cultivation, that they are purely and simply a sub-species of a terrestrial plant, and that they must be treated accordingly. Some may object to this description of their habits, but it is no more strange that they should be treated as terrestrial plants than Calanthes, which do uncommonly well when grown in this way, notwithstanding their epiphytical nature. If the grower wishes a first-rate return, he must so treat them, and he will find that it will add to his fame as a cultivator, and to the value of the specimen he is experimenting upon, if he gives the established plants a little weak diluted manure-water. It does them as much good in proportion to their stature as it does Eucharis amazonica, which so greatly delights in good feeding. Be cautious, however, and rather err in giving too little than too much. Do not starve the plants, either, by putting them in sandy, peaty, fibry compost; it may look well to those accustomed to such a way of potting, but it is only respectable starvation. These are but a few hints as regards their cultivation; but, simple as they are, if the grower acts upon them he will find a good outcome. I am not speaking exactly without experience; for I happened to be fortunate enough to grow what is vulgarly called the “deil’s dozen” of Masdevallia Harryana, bought from Messrs. Veitch for M. Veitchii, before, of course, Harryana was known. They cost the late Mr. Dawson twelve guineas; and, after a three years’ growth, and dividing up, and potting in, these original thirteen plants realised, at the

various sales, within a few shillings of £250. That was a fortunate hit; others did not prove so good an investment; but the instance just referred to shows what may be done by judicious culture. And this brings me to the concluding remark, not the least important, and that is, that the plants, if any amateur wishes to make the most of them, should be broken up and grown on afresh, as is done in the case of some Sarracenias, which, when grown singly and grouped together, make marvellously effective exhibition plants. If any of your readers wish any further information upon the subject, what I can give is freely at their service. JAMES ANDERSON.

Meadowbank Nurseries, Uddingston, Glasgow.

GREENHOUSE ACACIAS.

ACACIAS bloom from midwinter to midsummer, and the long-flowered covered shoots are serviceable in many, if not in all, kinds of floral decoration. I do not agree with those who consider that Acacias are only adapted for decorations on a large scale. Small plants flower for years before they become too large for ordinary houses, and as rafter and pillar plants many varieties can be permanently cultivated in all kinds of cool glass structures. They also attain the proportions of trees, in which state they are impressively grand when in full bloom. Examples of this are to be found in the large temperate house at Kew, and in the conservatory at Floors Castle. The specimen of *A. Riceana* at the latter place is unique, and is a most attractive object at all times, more especially when its long, graceful, weeping branches are clad with pretty pale yellow blossoms which are produced abundantly in March, April, and May. Some varieties can be readily increased from the roots and sucker-like shoots which they sometimes produce. The easiest way, however, is to propagate from seed, which is formed very freely in most instances. The seed is mature and fit for gathering when the outside of the pod becomes hard and assumes a brown colour; if left hanging after this time the capsule opens and the seed drops out. It may either be sown immediately after it is gathered or it may be kept dry for years and put in at any time. If kept for any length of time the seed gets very hard and should be soaked in water for a day or two before it is used, or it takes a long time to germinate. A single seed may be placed in the centre of a 3-inch pot, or a number may be put into a 5-inch one; in either case a mixture of loam and peat in equal parts, with enough of silver sand to make it glisten, should be used. The seeds should rest one inch from the surface; a bottom-heat of 70° hastens their growth in the winter and spring months, but during summer and in a mild atmosphere they germinate fast in a close frame without any plunging. Care must be taken never to let the soil in which the seed is sown become dry, and those raised singly in pots need not be hurried into others, for a 3-inch pot will accommodate any size under 8 or 10 inches in height. Those sown together should have the ball turned out of the pot entire, each plant being broken away with a quantity of soil attached to the root, and potted separately into 3-inch pots, after which a close, mild, moist atmosphere should surround them until a few inches of wood have been made, when attention must be given to their

General Cultivation.

At the second and all subsequent shifts the compost should be much the same as that first used, but in a rougher state. The plants will grow in good loam and sand, but, unless where peat is naturally bad, this does them no harm. Ample drainage is indispensable at all times. From a 3-inch pot they may be potted into a 5 or 6-inch one, and from this size into an 8-inch one, which will hold serviceable plants for years. Unlike some plants, Acacias do not bloom more freely when pot-bound, yet the roots should never be allowed to become an intricate mass before they are transferred to a larger-sized pot. In 10 or 12-inch pots, fine bushy plants, 5 and 6 feet high, can be accommodated. And these are extremely useful for setting in the centre beds of greenhouses and conservatories, where they associate well with Camellias, Azaleas, &c. Plants, in small or large pots, may be grown to any size or form, for, although they are naturally inclined to move rapidly upwards, this is easily prevented by cutting the leaders well in, and directing the principal growth about the base. Young plants may have the point taken out of the leading shoot when it is 6 inches high. For standards this may be left alone until the stem has attained the desired height, and the lower shoots should be taken off as upper ones are produced, until a well-balanced head on a clean stem is the result. This need not be included in the annual operation of pruning, which it is often necessary to perform on old plants in order to keep them in shape after they are fully formed. Pruning or cutting back should be done immediately the plants are out of flower, and before the young

growth appears, but unless the branches are becoming straggly no cutting back is needed. In either case they may be allowed to make their growth on the spot where they bloomed, or, if they are in the way there, in some other place with a temperature similar to it. When the young growths are pushing freely, large plants should be re-potted. A close atmosphere for a short time after this sustains the vigour of the young shoots, which soon bear full exposure outside in favourable summer and autumn weather. A greenhouse temperature is sufficient for them at all seasons, and they may be used for decorative purposes in October and November. The best-ripened wood blooms earliest, and a few well-managed plants will flower from January until May. When the plants become too large for pots, they succeed remarkably well planted out. This should be done when they are in the same state as that in which they should be when re-potted. The depth of soil may be from 2 to 4 feet, with from 3 to 6 inches of drainage. The one at Floors, to which I have referred, and those at Kew, are planted out. This method should not be practised unless plenty of head-room can be given to the plants. To plant out and be constantly cutting the best of the shoots back to keep them from growing against the roof, is a sure means of getting a great many stumps; but, when the branches can ascend unrestricted for 12 or 15 feet, the effect is worth all the room which is taken up. Where there are no means of growing Acacias in tree forms, they may generally be grown as climbers. From 6 to 30 feet of rafter or pillar may be covered with a single plant in a very few years. For the shorter distance it may be grown in a pot; but, for the longer, abundance of root-room should be provided, either by planting in a bed or border, or in a large square box or tub. Abundance of water should be supplied when the plants are growing freely, and it should be withheld when there is no great demand for it, ripening the wood by constant exposure after it has been fully made, and cutting the shoots in to keep them proportionate, and fitting to the position which they fill. Insects are not very liable to make their appearance on Acacias, unless they come in contact with other infested plants; but it is very difficult to get the mealy bug eradicated when once it gets amongst the leaves; in fact, it cannot be cleaned except by cutting the branches off nearly to the stem, and allowing new clean wood to form. Scale also works, when the opportunity is offered, on the surface of the bark. It is more inclined to confine itself to the thick parts of the wood than amongst the foliage. Brushing, and particularly scraping, are the easiest and surest means of eradicating it. Red spider seldom approaches healthy plants, and those subject to it may be relieved of its presence by frequent syringing with water.

J. MUIR.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Amherstia nobilis from Cuttings.—This fine stove tree is propagated in the Handsworth Nursery freely by means of cuttings, and a fine stock of young plants may now be seen there raised in this way.—W. HOWARD.

Layering Lapageria alba.—Messrs. Fisher, Holmes, & Co. have a fine variety of this which they are increasing by means of layers. A hundred and thirty young plants of it have been raised by merely pegging down the shoots in rough sandy peat, and potting them off when sufficiently well rooted to bear separation. The layering should be done as soon as the wood is thoroughly ripe.—W. HOWARD.

Fine Dendrobium densiflorum.—I have placed in our conservatory to-day a plant of this Dendrobium, on which there are twenty-seven spikes of flowers. On some of the shoots are three spikes, each about 8 inches long, and bearing thirty-six flowers. The plant is very pretty, and finer, though not more showy than the one of *D. fimbriatum*, of which I lately gave some account. It lasts a shorter time in flower than *D. fimbriatum*.—ROBERT MACKELLER, *Abney Hall, Chesham*.

Primula cortusoides amœna lilacina.—This is the most robust of all the *P. amœna* family. The flower-stems are stiff and the flowers erect. It makes a useful pot plant, and does well for spring bedding. This variety and *P. cortusoides amœna* are the two best. Then comes *grandiflora*, which has the largest flowers, pale red outside and white inside. *P. amœna grandiflora alba* has also large blooms, but very flaccid. I have also *P. amœna alba* and *P. cortusoides* in bloom; both small, but pretty.—A. D.

Hepaticas from Seed.—Not long ago I showed how large supplies of seed might be obtained from Hepaticas and how easily hybrid varieties might be raised. I sowed seed of my forced plants of them on April 12th; it is coming up satisfactorily and I am curious to know when I shall get the seedlings to bloom. I sow in pans in the lightest vegetable soil and prick out each seed individually, as all will grow if properly ripened. I would advise keeping the pans under glass and thoroughly moist. I never saw Hepaticas seed so freely as they have done this year, and no one should lose the opportunity of increasing *Hepatica angulosa* by this means.—FRANK MILES, *Bingham, Notts*.

Orchids in Flower at Gunnersbury.—Several plants of *Odontoglossum Alexandræ*, some having two spikes bearing upwards of twenty flowers, are now in fine condition at Gunnersbury, as are also *O. Rothschildii*, which was shown under that name last year, and which has on a single spike eleven flowers, spotted beautifully with purple, and brighter than when last exhibited; *O. Pescatorei*, a handsome species, bearing thirteen flowers upon a spike; *O. niveum majus*, with five spikes and sixty flowers; and *O. vexillarium*, throwing up two fine spikes from one bulb, with seven flowers on one and six on the other. The whole were in perfect health, and Mr. Richards informed me that he had not been without flowers of *O. Alexandræ* for a year, which is saying a good deal for this lovely Orchid, the blooms of which are invaluable at any season for bouquets and for table decoration.—A. OUTRAM.

THE FRUIT GARDEN.

SHADING PINES.

I NEVER expected to convince Mr. Muir that Pine shading was unnecessary; nor must he hope to satisfy me that the burning of the crowns of large fruits in the month of May, which he alleges he has seen, is to be traced primarily to an absence of shade rather than to some radical error in the treatment of the fruit. The fact that he has seen Pine-shading practised in six different Pine-growing establishments appears to be an altogether insufficient justification of the practice. I maintain that if Pines are grown properly, and are in a thoroughly healthy state, they no more require shading than Vines or Peaches, or than pits and frames that contain early Potatoes. I do not for a moment deny that Mr. Muir's Pine-apples, or even those of the "six different establishments," required the kind of attention he advocates to save them from being burnt, blotched, or contorted; but it only shows they were so weakly and badly grown that they could not support the strength of the very rays that are the life of fruits in a less abnormal state. Mr. Smith, in his remarks on Pine-apple culture (p. 387) does not even hint at shading; but I believe he touches the right note when he counsels the admission of air some time before sunrise. My own experience, which I may at least refer to as a somewhat lengthened one, has led me to the conclusion that air should even be admitted throughout the night whenever the weather is sufficiently favourable. The gases that accumulate during the night are thus dispersed before the sun strikes the glass. Apply freely but methodically moisture charged occasionally with ammonia, and give air at the front of the Pine pit or other structure in which the plants may be. In excessively hot weather the lights of Pine-pits may be tilted in such a way as to reduce the force of the sun's heat at mid-day. These matters to really practical gardeners are simple enough, and those who systematically adopt a method, which I myself have invariably found successful, will never find it necessary to apply shading to Pine plants during any stage of their growth. Painting the glass with milk and whiting is nothing more nor less than permanent shading by night and by day, during sunshine or cloud, until it happens to be washed off by rain; and plants thus coddled may attain any age before they fruit, as in the case of those Queens of which we have lately heard complaints.

JAMES BARNES.

Exmouth.

NEW PEARS.*

ROUEN is becoming a place of note among horticulturists as a new fruit-raising centre, and a competitor with some of the well-known Belgian towns for fame. Already it has produced some varieties that have proved of first-rate quality. It is now about twenty years since the *Passe Crassane*, raised by M. Boisbunel, fruited for the first time; and now it is a general favourite in the gardens of France, Germany, England, and even America. M. Pynaert, a Belgian pomologist, passes his opinion of the merits of the following varieties raised by M. Sannier, based upon specimens received direct from the raiser. The system of nomenclature adopted by M. Sannier is very severely criticised, and deservedly so, for long names are the plague of gardeners and a reproach to the giver. M. Sannier's names run chiefly upon the *souvenirs*, of which the following are specimens:—*Souvenir du Vénérable de La Salle*, and *Souvenir de la Rue Mare-au-Trou*. We agree with M. Pynaert in recommending the suppression of such long-winded names in favour of more simple appellations. At the end of February only two of the varieties were quite ripe. The first was *Louise Bonne Sannier*, a fruit of medium size and excellent quality, of which we shall shortly give a description; the other was *Beurré Henri Courcelle*. The specimen tasted would have kept longer—probably till the end of March. It is a delicious fruit. The flesh is exceedingly delicate, buttery, and melting, without the least trace of grittiness in the centre. It is abundantly juicy, very sugary, slightly and very pleasantly acidulated, with an aroma peculiarly its own. As one of the judges at the fruit show at Anger's last year, we tasted another variety, raised by the same gentleman, *Souvenir de Sannier Père*. Although this fruit was exhibited under unfavourable conditions a favourable judgment was passed upon it. But this by no means comes up to the raiser's estimate, who describes it as a magnificent and exquisite fruit, of an extremely agreeable perfume. However, it is impossible to form a correct idea of the merits of a new fruit at an exhibition.

The *Bergamotte Arsene Sannier* is still quite green in my fruit room. According to M. Sannier, it is a handsome and an excellent fruit, which will keep till May, and has a delicate flesh of delicious flavour. We can hardly suppose that M. Sannier would give his own name to a variety of inferior quality. This variety and

* Raised by M. A. Sannier, of Rouen.

the Beurré Henri Courcelle remind one in some measure of the Bergamotte Esperen, from which they were raised. The latter is undoubtedly an improvement, and if it also possesses the other qualities of its parent, especially its hardiness and fertility, it will deserve a place in every choice collection. This and the Bergamotte Arsène Sannier, Souvenir de Sannier Père, and Beurré Amandé—so named doubtless on account of its very decided Almond flavour—have been sent out this year. Another collection of ten new varieties, bearing the objectionable names referred to above, are announced to be sent out in the autumn of 1875. M. Sannier, of Rouen, a raiser of some excellent Pears and other fruits, has hit upon an ingenious method of accelerating the fruiting of seedling fruit trees. True, it is not altogether new, for a similar procedure is practised by fruit forcers in this country to induce fruitfulness. It consists in pot-culture for several seasons of those whose early fruiting is particularly desired.

Leonce de Vaubernier.—A coloured portrait of this Pear, which was raised by the late Léon Leclerc de Laval, and sent out by M. Hutin, is given in the April number of the Bulletin of the Belgian "Cercle d'Arboriculture." It had not been previously described, except in general terms in the catalogue of the firm Simon-Louis, where it is placed in the third class for quality; but this class, it should be mentioned, includes many very good varieties. M. Burvenich says that although he cannot affirm that it is really a first-class variety, yet he believes the firm mentioned has underrated its merits. It is of very regular obovate shape, slightly hollowed at the sides; skin, rough, russeted on an olive ground, strongly tinged with deep red and dotted with yellow on the sunny side; stalk, short, woody; eye, rather large, open, calyx-lobes coriaceous; flesh, yellow, moderately fine, very agreeably perfumed, and of quite a peculiar texture; it is at once unctuous, firm, and compact. The wood is of a very bright shining brown, thinly besprinkled with small elongated lenticles; buds, moderately large, on short stout shoots. An exceedingly prolific variety, either on the Pear or Quince stock, of moderate vigour. Altogether the qualities of this Pear constitute a distinct type in colour, flavour, and the substance of its flesh. Briefly, it is a good fruit, ripening in September before a great glut of varieties come in. H.

THE TRUE FRENCH PARADISE APPLE.

THIS is figured in the last number of the "Florist and Pomologist," and its true character again pointed out, as it was seven years ago by the founder of THE GARDEN, it being pronounced tender and useless at that time by various gentlemen whose opinions had much weight in such matters. As no allusion is made in the article to this fact, it may be well to bear in mind the opinions held of the stock seven years ago, and contrast them with those which follow:

"We have much pleasure in submitting a figure of the true French Paradise Apple, the Pommier de Paradis, which, when used as a stock, is of such inestimable value in inducing dwarfness and prolificacy in other varieties of Apple. 'Mr. Barron has collected from various sources, British and Continental, a number of Apple stocks, which are growing side by side, so as to admit of easy comparison. Side by side, also, are various Apples worked on the several stocks. There are the Crab stocks (Pommiers francs), with long, spreading, rigid, wiry, tangled branches, of a deep purplish-black colour, and at the time of our visit (April 11) with no vestige either of leaf or flower to be seen. There is the Dutch Paradise, of straggling habit, with olive-coloured shoots, in full leaf, but without a flower. There is Mr. Rivers's Nonsuch English Paradise, destitute of leaf or flower, and Rivers's Miniature Paradise, equally late, and scarcely justifying its name. There is Mr. Scott's Paradise, of very distinct somewhat pyramidal habit, in full leaf, but with scarcely a flower to be seen. There is the Doucin, also of pyramidal habit, and producing flowers early. Then there is the true French Paradise, Pommier de Paradis, obtained from the most reliable sources in France, which must unquestionably bear away the prize for precocity of flowering and abundance of bloom. By precocity we mean not early flowering with regard to season, but with reference to age also; while other stocks of the same age have not reached the fruiting stage, this one has already done so. It is of rather straggling habit, but full of flower. While some stocks at the time of our visit were showing few flowers and others none at all, this one stood out in the row sheeted over with pale pink blossoms. These qualities it very markedly contributes to the grafts. Short compact growth, and early and abundant flowering, characterise the scions grafted on this stock, as they characterise the stock itself. A long row in one of the quarters, consisting of various Apples grafted on this stock, side by side with rows grafted on other

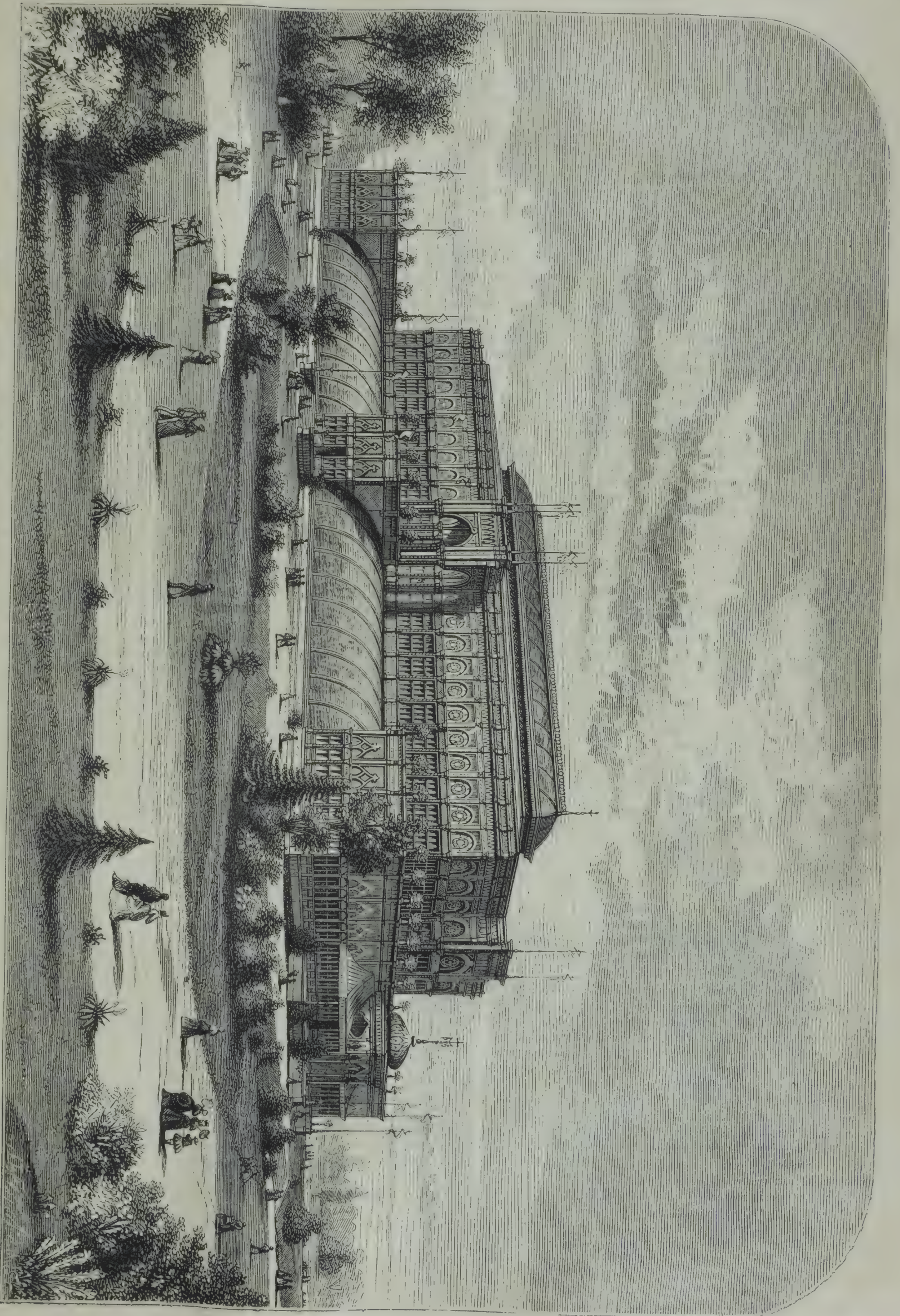
stocks, is one of the most striking illustrations of the effects and consequences of grafting it has ever been our fortune to witness. The difference in appearance is so great that it would almost seem as if the one row were cultivated for fruit, the other for timber! By way of illustration we may mention the Rhode Island Greening, a vigorous-growing kind, but which when worked on this stock becomes subdued, assumes a short, bushy habit, and produces an abundance of early bloom. What was formerly grown at Chiswick under the name of French Paradise is quite a different thing, and relatively very inferior. Of course this Paradise stock is not intended for orchard use, where the freer-growing stocks are preferred."—(Mr. Barron in "Chronicle," 1874). The French Paradise stock referred to in these remarks is that which we now figure. The plant is of spreading habit, with purplish shoots. The inflorescence is abundant, and precocious as to season, and also in relation to the age of the plant. The young leaves are glabrescent, oblong-lanceolate, the apex acute, the base rounded, the margin crenulated, the crenulations mucronulate; the petiole is less than half the length of the leaf, setose, and the stipules are linear-subulate, as long as the petiole. The peduncles are about three-quarters of an-inch long, setose; the flower-tube glabrous urceolate, reddish, one-eighth of an-inch long; the calyx-lobes triangular, gradually acuminate, setose within; the petals concave, oblong-obtuse, tapering at the base into a short stalk, and provided with a few cottony hairs on the inner surface; the styles are crested at the base for a short distance, and there slightly covered with cottony hairs, dividing above into five stigmatic branches. The fruit, which is a really good early eating Apple, is, according to our notes, of medium size, oblate, somewhat angular, yellow, changing on the exposed side to deep golden-yellow, and sometimes having a thin flush of rosy-red. The eye is broad, but closed, sunk in a rather deep cavity. The stalk is short, scarcely projecting from the hollow, which is not so deep as that of the eye. The flesh is pale straw colour, fine grained, solid, juicy, and with a brisk agreeable flavour. It ripens in the middle and end of August, and would form a good useful early dessert Apple, independent of its value as a dwarfing stock for Apple trees grown in the bush or pyramidal form."

T. MOORE, in "Florist," May, 1875.

PHILADELPHIA HORTICULTURAL EXHIBITION.

As this exhibition promises to be the most remarkable one to be held for some time to come, we have thought it desirable to give an illustration of that section which is to be devoted to horticulture. As will be seen, it is an extremely ornate building, and one which is to remain in permanence as an ornament of Fairmount Park. It is located on the Lansdowne Terrace, on the north of the main building and art gallery, and has a commanding view of the Schuylkill River and the north-western portion of that city. The design is in the mauresque style of architecture of the twelfth century, the principal materials externally being iron and glass. The length of the building is 383 feet; width, 193 feet, and height to the top of the lantern, 72 feet. The main floor is occupied by the central conservatory, 230 by 80 feet, and 55 feet high, surmounted by a lantern 170 feet long, 20 feet wide, and 14 feet high. Running entirely around this conservatory, at a height of 20 feet from the floor, is a gallery 5 feet wide. On the north and south sides of this principal compartment are four forcing houses for the propagation of young plants, each of them 100 by 30 feet, covered with curved roofs of iron and glass. Dividing the two forcing houses in each of these sides is a vestibule of 30 feet square. At the centre of the east and west ends are similar vestibules, on either side of which are the restaurants, reception room, and offices. From the vestibules ornamental flights of stairs lead to the internal galleries of the conservatory, as well as to the four external galleries, each 100 feet long and 10 feet wide, which surmount the roofs of the forcing houses. These external galleries are connected with a grand promenade, formed by the roofs of the rooms on the ground floor, which has a superficial area of 1,800 square yards. The east and west entrances are approached by flights of blue marble steps from terraces 80 by 20 feet, in the centre of each of which stands an open kiosque 20 feet in diameter. The angles of the main conservatory are adorned with eight ornamental fountains. The corridors which connect the conservatory with the surrounding compartments open up fine vistas in every direction. In the basement, which is of fire-proof construction, are the store-rooms and heating arrangements. For the accompanying illustration we are indebted to the gentlemen connected with the horticultural department of this, in every way, great undertaking.

ALL bachelors are not entirely lost to the refinement of sentiment, for the following toast was lately given by one of them at a public dinner: "The ladies—Sweetbriars in the garden of life!"



BUILDING FOR THE HORTICULTURAL DEPARTMENT OF THE PHILADELPHIA INTERNATIONAL EXHIBITION.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Sowing Beet, Planting out Lettuce, &c.—The principal crop of Beet should now be sown, and, as this is a deep-rooting plant, the ground should be deeply dug and well pulverised. The latter operation is essential for the generality of crops, and for none more so than those that penetrate deeply into the soil, and are of a bulbous or tuberous-rooted character. The seeds of this vegetable, not suffering from the attacks of birds or insects, like many others, do not require sowing so thickly; but sufficient seed must be put in to secure a crop, without having resort to filling up blanks by planting; for, although Beet will succeed when thus treated, yet it entails more trouble; and, in dry localities in a hot season, these plants do not root so freely as some others. Plant out Lettuces that have been sown in the open air as soon as they are large enough to handle; if they are removed to where they are to be grown when the leaves are $1\frac{1}{2}$ inch long, they suffer much less than if allowed to get larger before removal. Upon this, in a great measure, depends their ability to stand long without running to seed; much also depends upon their receiving plenty of water until they have taken a firm hold of the soil. The very slight rainfall that we have had since the commencement of the present year has caused a much drier condition of the ground than usual, and, should this state of things continue, it will soon be necessary in dry places to give water to early Cauliflowers, Cabbages, and autumn-planted Lettuces; where these have been planted on land that has been insufficiently manured, it gives an opportunity for assisting them with manure-water. All amateurs' gardens should be provided with a supply of this, proportionate in quantity to the size of the garden. A brick-and-cement tank sunk in the ground, or a hogshead standing on a few bricks, will last for many years. If horse-droppings are available at a small cost, nothing better is required, a bushel to every twenty gallons of water being used; if a couple of spadefuls of soot be added to a hogshead of the above, it will much improve its fertilising qualities, as well as destroy any offensive smell. For the same purpose wood ashes in similar quantities can be used. Stir the mixture up two or three times in the course of a few days, but, before employing it, let it settle so as to be quite clear; for, if made use of in a thick muddy state, it forms a crust upon the ground impervious to either rain, sun, or air. If the amateur has to purchase material to make his liquid manure, there is nothing better or cheaper than good guano; a handful of this to every eight or ten gallons of water well stirred up for a few days before use, with a little soot added, will make an excellent fertiliser for all plants that require it. For plants in pots, except such gross feeders as Chrysanthemums, the mixture should be diluted with a fourth more water before it is applied. Guano-water is, perhaps, the least offensive of any liquid manure that is used; but, whatever is employed in this way, should be stored at the further end of the kitchen garden. House slops and the liquid from stables or cowsheds are most valuable for use in this manner; and, if to these a little more soot or charcoal be added, there will not be found anything objectionable in their use. Half a gallon of the liquid mixed with three parts of water to each Cauliflower or Cabbage when in full growth will do more than a considerable quantity of solid manure; it also acts rapidly, the plants getting it when they stand most in need of a stimulant. It may be as well to remind amateurs that all outdoor plants to which manure-water is given will bear it much stronger during showery weather than when it is dry. In applying liquid manure it is a very common practice to pour it right up to the stems of the plants; this is just where it is the least effective, for it should reach the extremities of the roots, and these will generally be found in the greatest numbers midway between the plants as they grow. Hoe and stick Peas as soon as they are large enough, and keep the soil well drawn up to the stems of Cabbages or Cauliflowers, or they may suffer from the wind, especially in exposed situations. As Potatoes make their appearance above ground draw the soil well up to them so as to protect them from the slight frosts that are still liable to occur. Potatoes that are planted at the foot of south walls will be much benefited by an occasional soaking with water.

Flower Garden.—In the south of England many will now have commenced bedding-out, yet it is not well to begin too soon. Bare empty beds are unsightly enough, and if they have been in this condition since their last summer occupants were removed, the desire to alter their appearance is not to be wondered at. This, and a few hot days, frequently tempt people to bed-out too soon, but we generally experience some cold nights about the middle of the month, and their effects upon bedding plants, if they do not destroy them outright, are to induce that hard stunted condition which it takes some little time to alter, whereas, if planting out had been delayed for a week, the plants would have grown away without any stoppage. Calceolarias being much less susceptible to injury from a

low temperature than most other bedding plants, may be put out at once. Of late years these have gone off in dry weather to such an extent as to deter many from planting them. It should be borne in mind that bedding plants of most kinds, from the rapidity of their growth, and from being so closely planted, are a most exhaustive crop, and, in a few years, impoverish the soil very much, a condition not entirely remedied by the use of manure, which is not nearly so effectual as the partial or complete removal of the soil in the beds. Calceolarias are almost indispensable in a modern flower garden, as no other yellow flower has been found to approach them in effect. Where a difficulty has been found in growing them, I recommend, if the soil they are to occupy be old, that it should be renewed, and plenty of manure added; when they are being put out make the holes large enough to allow the surface roots to be covered an inch. When the work is completed they should be thoroughly soaked with water at the time, and should never, through the whole season, be allowed to become dry. To accomplish this it is well to leave a shallow basin round each plant, otherwise, after water has been given two or three times, the surface becomes baked, and it runs off to the sides of the beds. A slight mulching of well-rotted dung is also of value. If these directions were followed, especially as regards a good supply of water, we should hear less of Calceolarias going off. Where the beds are filled with spring flowering plants, it often seems a ruthless proceeding to remove many of them, particularly such kinds as red and white Daisies, that are usually at their best just as the summer plants require their room. The present late season will make this more apparent; and, to meet this difficulty, those plants that are to occupy the beds, may, for the present, be removed into larger pots, where their development will still proceed, and the spring occupants of the beds may, for a short time, be left undisturbed. These extra-sized plants will furnish the ground at once. As the spring subjects are removed to the reserve ground, no delay should take place by keeping them out of the ground longer than necessary; and they should be plentifully supplied with water, until established. The result of inattention to these matters will be apparent in the condition of the plants in the autumn. Where the stock of any plant is deficient, or the plants are getting too large, they may be increased or divided as required. Attend well to the different plants that will be bedded out shortly, especially to the various kinds of sub-tropical plants; for, although these and the more tender subjects used in carpet arrangements will not be put out until the beginning of the next month, yet upon their thorough preparation, in a great measure, depends their well-being when exposed to the open air.

Herbaceous Borders, Lawns, &c.—Borders will now be very attractive; keep their surface quite free from weeds, and in an even condition. Never resort to the objectionable practice of tying the leaves of Crocuses in knots; it prevents their being properly matured; for they suffer from the want of light and air when so treated. Their appearance is also much better loose in their natural way than so bunched up. See that everything that requires them has supports before being injured with the wind. Any of the more tender annuals that are to be sown in the open ground should now be put in. If dry, water the soil well previous to sowing. Keep the Grass regularly, but not too closely, mown, so as to preserve an even green surface. Such weeds as Dandelions and Plantains may be destroyed by persistent cutting below the collar. Weeds on walks should, as soon as visible, be removed, thus maintaining perfect order, and the work will in the end be less heavy.

Pits and Frames.—Tomatoes that were sown early should not be allowed to become pot-bound and stunted; where they require it they ought to have more root room. A slight hotbed should be made on which to plant out Vegetable Marrows, using a small frame, or a hand-light or two; a very little heat will suffice to give them the start they require. Give them sufficient water and shade for a few days if the weather is bright until the roots lay hold of the new soil.

Houses.—Peaches that have been brought on in houses by sun-heat, with only sufficient fire to exclude frost on cold nights, will now be swelling their fruit. Thin them sufficiently, but not too much, leaving enough to supply the place of such as may fall in stoning. Disbud gradually, but by no means let this operation be carried too far or remove too many leaves at a time. We frequently see trees so denuded of their foliage by this disbudding as to give both the trees and the crop they are bearing a serious check, for it should always be remembered that the roots receive a check corresponding to the proportion of leaves removed. Syringe the trees every afternoon sufficiently early to allow the leaves to get dry before nightfall, but care must be taken not to close the house too soon in sunny weather, and also to give air early enough in the mornings to prevent the temperature getting too high—70° without air is enough. If the

temperature ever gets too high until after the stoning process has taken place the chances are that the fruit will fall off. Give plenty of water to the roots; no fruit we cultivate under glass or in the open air suffers so often through insufficiency of root-moisture as the Peach.

Flower Garden and Pleasure Ground.

The quantity of bedding plants required in most garden establishments is often greatly in excess of the space that can be afforded for their accommodation, and much difficulty is frequently experienced about the present time in finding even standing room for them under glass; but well-established plants of various species may now be placed in the open air in sheltered positions, where they can have the temporary protection of a covering of mats, frigi domo, or canvas when required. This will be found sufficient for such species as the Verbena, Petunia, Lobelia, Calceolaria, Zonal Pelargonium, and the tall-growing variety of the Ageratum, &c.; while the dwarf variety or Imperial Dwarf, an exceedingly useful plant, but less hardy than its tall congener, should still be retained under glass, as should also Heliotropes, Iresines, Coleuses, Tricolor and variegated Pelargoniums, &c., while the propagation of the various Alternantheras may still be proceeded with unless the stock of these plants already rooted is considered to be sufficient; but, if this is not the case, they will all be found to root more freely now than earlier in the season. Many annuals which have been raised under glass, and which may have been pricked into seed-pans, boxes, or frames, will now be ready for planting out where they are intended to flower; and advantage should be taken of showery weather for the performance of this operation. The plants should afterwards be well attended to, with water during dry weather, until they become well established in the soil. Annuals, which may have been sown in the open air, where they are intended to flower, will now require to be carefully thinned out, and the surplus plants may, if required, be planted elsewhere, and will generally be found to succeed as well as those left where they were sown. Even Mignonette, which is not considered to transplant well, will, nevertheless, succeed, if carefully attended to with water. The finest line of this plant that I can recollect having seen was composed of the new variety, Victoria, every plant of which had been so treated. All climbing or tall-growing annuals, such as the various kinds of Sweet Peas, Convolvuluses, Tropæolums, &c., should be staked as soon as they are a few inches in height. Early flowering Tulips have seldom been finer than they have been this season, and they, together with several other spring flowering plants, are still in considerable beauty; and this year it will be necessary to remove many of them before this has quite disappeared. The reserve ground should, therefore, now be got in readiness for their reception, and the transferring of such plants to this situation, should, if possible, be accomplished during showery or cloudy weather, in order that the plants removed may receive as little check as possible. Many of the plants used in carpet bedding are nearly hardy, such as the Echeveria secunda glauca, Sempervivums, Sedums, the Golden Feather Pyrethrum, Stellaria graminea aurea, and others; and, wherever the beds intended to be planted in this style are at liberty, the soil of the same should at once be properly prepared, and the intended patterns should be sketched out, the marginal and divisional lines planted, and the spaces for tender species left to be filled in, when this can be done with safety. As a rule, flowering plants should be excluded from this style of planting, and the many fine foliaged species, which are best suited for this purpose, have a considerable advantage over flowering plants, inasmuch as no amount of rainfall is likely to be injurious to them, but tends rather to enhance their beauty. Stake, where necessary, and attend to the wants of, herbaceous plants of all kinds, and frequently stir the surface of the soil, keeping it entirely free from weeds. Attend also to beds of Roses, which about this time are likely to be attacked by aphides and caterpillars. The latter must be carefully picked off by the hand, or crushed by a gentle pressure of the young foliage upon which they are feeding; and the plants can be freed from aphids or green-fly by being well dusted with Pooley's tobacco-powder during calm evenings, and should be well washed with the syringe or garden-engine on the following morning; or the plants may be kept clean by repeated syringings with diluted tobacco-water. Continue to extract Plantains, and other weeds, from lawns and Grass verges, and mow the same as often as this may be found to be necessary. Much of the ultimate beauty of the lawn, &c., depends upon getting it into good condition at an early period of the season. Keep gravel walks free from weeds, and take every advantage of the gravel being soft from recent falls of rain, to pass the garden roller over their surface. Attend also to the watering and mulching of all recently transplanted trees and shrubs. While the weather continues dry, and wherever it is found necessary, let

them be securely staked, to prevent them from being loosened in the soil by the action of the wind.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Orchids.

The greater part of the East Indian Orchids will now require to be plentifully supplied with water, and those that have not been potted should have a top-dressing of fresh Sphagnum Moss, which should be allowed to grow over the surface; if it does not keep healthy by regularly watering, then we must expect the soil to have become sour, while, if the Sphagnum grows freely, we may conclude that it is fresh and sweet. Aërides, Vandas, Saccolabiums, and Phalænopsis will be rooting freely this month; to keep the wants of these plants properly supplied, a greater amount of moisture will be required than heretofore, and an atmosphere of 70° should be maintained by night and 85° by day with sun-heat. Plants on blocks will require syringing twice a day, and such plants as are suspended will require daily attention; of Calanthe Veitchii and vestita, varieties that are growing should have a place in the East Indian-house, or a warm Vinery, and be moderately supplied with water at the root till the formation of the bulb commences to show itself, syringing slightly over their leaves. Growing Dendrobiums require a warm moist atmosphere, for, if placed in too dry an atmosphere, they become infested with red spider and thrips. The greater portion of the Cattleyas, will be making roots, and will require great care in watering, for, if supplied too freely when very young, they are apt to damp off; the temperature should be 65° at night and 75° by day with sun-heat. Lycastes that require potting should be looked to or top-dressed according to circumstances. Plants of Coelogyne cristata will be beginning to grow, and therefore they must not be syringed, but supplied with water through a small water-pot between the bulbs, so as not to allow any to lodge in the young growths. Miltonias, Epidendrum vitellinum, and Barkerias, should now be supplied with large quantities of water. Pleiones growing freely should receive liquid manure twice a week, and their leaves should be syringed twice a day. A larger amount of moisture will be needed in the Odontoglossum-house, which should be thickly shaded on very bright days. Oncidium macranthum will be growing freely this month, and should be kept saturated with water, and placed at the coolest end of the Odontoglossum-house to grow. Disa grandiflora should receive liquid manure twice a week, and should be saturated with water while growing. Masdevallias should also be kept very moist at the root and thickly shaded from the sun, and they should have an Odontoglossum-house temperature. Orchid-houses will now be gay with Cattleyas, Cypripediums, Odontoglossums, Masdevallias, Aërides, Saccolabiums, Brassias, Sobralias, Phalænopsis, Dendrobiums, and others.—E. CULLEY.

Indoor Fruit Department.

Vines.—Pay great attention to the stopping and tying of shoots in late Vineries; it is much better to pinch growth immediately the bunch is fairly visible, at two joints beyond it, than to allow 2 or 3 feet to be formed before stopping. Great care is needed in tying down tender shoots; when pressed beyond their strength they are very liable to break off at the base. Shoots, bearing no bunches, may be stopped at the third joint from the main stem, when several good buds will be formed, some of which may produce something more fertile next season. Lateral growths are quickly produced after the shoots are checked; these should be pinched at the first leaf, and should never be permitted to proceed further than another leaf beyond this. The principal wood of many Vines is frequently suffocated with straggling lateral growths, which preclude air and light, and prevents the ripening of both fruit and wood. Golden Champion and other large berried sorts are sometimes given to cracking or splitting; this evil may be entirely obviated by notching the shoot half through below where the bunch is connected; this modifies the flow of sap, a pressure of which appears to cause the disturbance. The berries or bunches may be thinned out to a greater extent now, and after this time, than they were in the early part of the season, as the berries swell more in the summer than at any other time. The earliest potted amongst young Vines should have made enough roots by this time to feel the benefit of weak applications of liquid manure, which may be given with much benefit at every other watering. Dissolved sheep and cow dung, and guano mixed together or separately, are substantial fertilisers, but it is great waste to give liquid manure when the ball of soil is very dry, as it passes through at the bottom, and runs away without doing any good. Dry soil about all plants should first be moistened with clean water, and there is then every chance of the fertilising property of the liquid manure resting about the roots when applied a short time afterwards.

Pines.—Where a great number of Queens have been started into fruit simultaneously, they will ripen together unless some of them are retarded, in order that they may come in one after the other. A

long succession is best obtained from a batch of this description by removing some of the plants, with the fruit attached, when the latter is not quite half-ripe, into a shaded house or room, with a temperature of about 50°, and where a circulation of dry air is going on. A fruit which would become dead ripe in a close warm stove in a week will not arrive at that state for more than a month when subjected to this treatment. When it is intended to keep the fruit back for a considerable time, removal should take place shortly after colouring has begun. The flavour is seldom deteriorated much through the ripening being retarded.—J. MUIR.

Hardy Fruit.

The prospects of all kinds of fruit could not possibly be better, and we may now feel comparatively safe, but coverings should not yet be finally removed. The foliage and new growths on several kinds of fruit, such as Apricots, Pears, Currants, and Gooseberries, are now large enough to form natural protection for fruit and blossom should sharp frosts occur, and therefore pinching or cutting back the breastwood, as it is called, should be deferred for a time until all danger from frosts is over. Unremitting attention will now be requisite to ward off the attacks of aphides, for, if once these pests get a thorough hold upon the trees, all hopes of fruit that is fit either to be seen or eaten are at an end, and the crop of next year is also endangered. Tobacco powder or snuff, applied through a flour dredger, is the best remedy I know till the fruit is set, but afterwards frequent washing with clear water will keep down all kinds of insects and prove beneficial in a variety of ways. It should be applied with a certain amount of force, as through a syringe, garden-engine, or hose. Keep a sharp look out for grubs on Apricots, and caterpillars on Gooseberry bushes, and as there is no remedy so effectual as hand-picking let it be done at once. Pears, Peaches, and Apricots, that have set their fruit thickly, should be thinned out as soon as it can be seen which fruits are likely to swell best. As to thinning, it is very difficult to give precise directions, for experience alone must teach how thin they ought to be, or how many or much fruit a given tree is capable of bringing to perfection. Quality, rather than quantity should be aimed at in fruit culture; certainly, one large and well-flavoured Pear, Peach, or Apricot is preferable to two small ones, and especially with the two latter kinds, the stones of which are a consideration. When thinning, the guiding principle should be to have each fruit clear of its neighbour, evenly distributed over the tree, and fully exposed to sun, air, and light. Young recently-planted trees will require to have the shoots regulated and pinched, trained, or tied into the form they are to assume; in doing which, care should be exercised to have the tree equally balanced, that the flow of sap may be alike over all parts. Any shoots that manifest a tendency to grow stronger than the rest, may be checked by bending them downwards, and keeping the lateral growths closely pinched off; but weak shoots should be allowed to retain all lateral growths made, at least for a considerable period. Canker and gum are the inevitable consequences of too tight ligatures and injury from nails, or bruises in other ways, all of which should be guarded against. Strawberries have made rapid progress during the last few days, and are now throwing up their flower-stems. If it has not yet been done, a mulching of long litter should be applied to them, for the double purpose of keeping the fruit clean at ripening time and to prevent the too rapid evaporation of moisture. Short Grass, or lawn mowings, so frequently used for this purpose, is most objectionable, as a heavy rain splashes the particles of Grass over the fruit, to say nothing of the labour involved to eradicate the weeds thus sown. Plant out the forced plants as directed in last Calendar.—W. WILDSMITH, *Heckfield*.

ALOE HANBURIANA.

Mr. C. NAUDIN pays the following graceful compliment to the memory of the late Mr. Hanbury in the "Revue Horticole:"

"Cette dédicace est un hommage à la mémoire d'un ami dont la mort, aussi inattendue que prématurée, remplit de deuil l'âme de ceux qui ont vécu dans son intimité. Membre de la Société pharmaceutique, de la Société linéenne de Londres, Daniel Hanbury s'était fait connaître comme botaniste, par ses nombreuses communications, qui avaient principalement pour objet les plantes médicinales. Cet amour des plantes s'alliait naturellement chez lui avec le goût de l'horticulture, et il utilisait au profit de ses études favorites le jardin de son frère, situé à la Mortola, près Menton, sous ce merveilleux climat où tant de végétaux exotiques donnent en quelque sorte la main à ceux des pays tempérés. Bien souvent Daniel Hanbury faisait le voyage de Londres à la Mortola pour visiter les plantes qu'il y avait introduites; mais ses libéralités s'étendaient plus loin, et le modeste jardin d'expériences de Collioure en a eu sa large part. Au

nombre de celles que j'ai reçues de lui se trouve le bel Aloès qui va faire le sujet de cette note. Il est en ce moment dans toute sa beauté, et j'allais faire part de ce succès au généreux donateur lorsque la fatale nouvelle de sa mort m'est arrivée. Depuis plusieurs années, Daniel Hanbury s'occupait avec assiduité d'un grand travail de pharmacologie, travail si considérable qu'il a dû s'associer, dans ces derniers temps, le docteur Flückiger de Strasbourg. Avait-il le pressentiment de sa fin prochaine? Je serais presque disposé à le croire, lorsque je pense que l'année dernière, au moment où tant de botanistes se rendaient à Florence pour assister à la grande Exposition horticole, il m'écrivait que lui aussi aurait volontiers cédé aux sollicitations du docteur Parlatore; mais, ajoutait-il, 'la vie est courte et incertaine, et je sens le besoin d'économiser le temps pour achever mon travail.' Il l'a achevé, néanmoins, il y a quelques mois seulement, et peut-être ce dernier effort a-t-il hâté l'heure fatale. Il a succombé le 24 Mars dernier, à l'âge de quarante-neuf ans, dans sa maison à Clapham Common, près de Londres. C'est un malheur pour la science qu'il cultivait avec intelligence et ardeur, mais il se survivra à lui-même par l'important travail auquel il a consacré sa vie, et par les souvenirs qu'il laisse dans le cœur des nombreux amis qu'il s'était faits par la délicatesse de ses sentiments, sa générosité et l'aménité de son caractère. C'est en 1873, si j'ai bonne mémoire, que j'ai reçu de lui la plante dont il va être question. Ce n'était alors qu'une plantule fraîchement germée, et dont la graine était venue de la Cafrerie, avec cette seule indication: *Aloe foliis rubro marginatis*. Mise en pleine terre, à l'air libre et sans autre abri que le voisinage d'un mur peu élevé, elle a passé deux hivers absolument indemne, quoiqu'elle ait dû éprouver à plusieurs reprises de froids de 2° à 3° au-dessous de zéro. Sa tige, cachée par la rosace des feuilles, n'a guère que 4 à 5 centimètres de hauteur; les feuilles, larges presque comme la main, mais un peu plus longues et très-épaisses, sont embrassantes, ovales-aiguës, inermes, très-lisses, d'une teinte glauque rougeâtre, avec un liseré rouge très-net le long des bords. Du centre de la rosace s'élève une hampe de la grosseur du petit doigt, dressée et ferme, haute de 45 centimètres environ, divisée à sa partie supérieure en nombreux rameaux formant le corymbe, et dont les subdivisions portent plus de cent fleurs pendantes, grandes pour le genre (4 centimètres environ de longueur), tubuleuses, à limbe court et un peu réfléchi, du plus beau rouge corail qui se puisse voir. C'est, au total, une superbe plante, que la facilité de sa culture et sa rusticité relative, autant que sa beauté même, recommandent aux amateurs de plantes grasses. Sa taille peu élevée, jusqu'ici du moins, pourrait en faire une plante de fenêtres et d'appartements, et elle serait prise sur les marchés aux fleurs de Paris. Si elle mûrit des graines, ce qu'on peut espérer dans une saison comme celle à laquelle nous entrons et qui est déjà chaude, je serai heureux de propager, au profit de tous, une plante qui me rappelle des souvenirs à la fois si tristes et si chers."

Cannon Hill Park.—Very extensive alterations are being carried on in this Birmingham Park, at the instigation and through the munificence of Miss Ryland. The dreary stretch of meadow land, which lay at the extremity of the ground on the right, has been thoroughly turned over since last summer, and is now being moulded after Mr. Marnock's pleasing designs. Starting from the boat-house to the right of the refreshment-rooms, and passing on towards the south-western end of the park, we find in the course of construction a large boating-lake, which, when completed, will cover an area of no less than 4½ acres of ground. The excavations were commenced as early as October last, the contract being placed in the hands of Mr. Meston. Up to the present time the work has been vigorously pushed forward, and the heavy labour having for the most part been successfully got through, the finishing touches only are needed to complete a very charming transformation. The lake will be 4 feet in depth, and oblong in shape, with graceful indentations along the shore. It contains three islands, which bedded out with shrubs and summer plants, and enriched with grottos and other artificial embellishments, will be very effective and picturesque.

CARNIVOROUS PLANTS.

What's this I hear,
My Mollie dear,
About the new Carnivora?
Can little plants
Eat bugs and ants,
And gnats and flies,
Why—bless my eyes!
Who is the great discoverer?
Alas 'twould be
Sad news to me,
To hear your own dear Fido, pet,
Had lost his breath

In cruel death,
Because one day
In thoughtless play,
He went too near a Violet!
And yet to die
By blossoms, I
Would call a doom chromatic,
For one might wait
A harder fate
Than have a Rose
End all his woes
In pain called aromatic.

THE KITCHEN GARDEN.

THE WITLOOF.

THROUGH the courtesy of Messrs. Vilmorin-Andrieux and Co., we are enabled to give representations of the Witloof, a new vegetable (described at p. 268), the cultivation of which, as a salad plant,



The Witloof.

appears likely to become extended on the Continent, though it may be some time ere it finds favour amongst English growers. It is a kind of Chicory that is cultivated in Belgium for the leaves, which, when blanched, make an excellent salad, less bitter than the better known Barbe de Capucin, a plant belonging to the same genus, and devoted to the same uses.

EXPERIMENTS WITH SEED POTATOES.

I HAVE spent a good many pounds in testing the new sorts of Potatoes that have been offered to the public during the past ten or fifteen years; and with your permission I will briefly give the results of experiments during the past two or three years.

Extra Early Vermont has been in cultivation for the past three years, side by side with the Early Rose, no difference in soil or culture; the first year, while the Early Rose rotted badly, not one of the Extra Early Vermonts was affected in the least with the disease; the stalks were more thrifty and stocky on the Vermonts, and the Potatoes were fully a week the earliest in getting fully ripe. Two years since I purchased one pound each of the Extra Early Vermont and Compton's Surprise, and from that pound of Early Vermonts I dug four bushels of as fine Potatoes as I had ever dug in my life; and they were much larger than I have ever had the Early Rose grow on my farm; thicker, and not so long as the Early Rose; not an unsound Potato among them, neither were they rotten the next spring when taken from the cellar to plant. This year has been a repetition of the two preceding ones, adding to the proof of its great value. For the past three years they have been decidedly better in quality than the Early Rose, although they very much resemble that variety, and have yielded much better on my land.

Compton's Surprise, the first year, did not equal the Vermonts in yield, but were the best Potato for eating we had seen on our table for years. We ate but few of them, as we wished to keep them for seed; but they were tested at different times till May, and found good at all times. This season they have distanced all competitors in productiveness, and their good quality is not abated. I planted May 16th, on dry sound soil on which corn had grown the year previous; they were fully ripe and fit to dig early in September.

Brownell's Beauty has also been in cultivation two years, my seed being direct from Mr. Brownell. This has done finely, but it has not borne off the palm for productiveness. It is of excellent quality, and I should judge from its great productiveness with other persons that it will prove a success over a wide portion of the country when it is better known. They have all proved successful with me, but Compton's Surprise was the best last year.

The Excelsior has been our table Potato the past five or six years, and it is a first-rate Potato for the table, yields well, is rather late, and some seasons has many small ones. Some years it will yield as well as the Peerless. Three years since I sold a customer a barrel of them, and he reported to me in the fall a crop of 130 bushels of the finest Potatoes he ever saw.

Carpenter's Seedling is a good, productive Potato; looks very like the Early Rose; some praise it very highly for productiveness and table quality, but it is not equal to the Extra Early Vermont either in yield or quality.

Ice Cream.—This Potato has a peculiar growth; the leaf is partially curled like the Hubbard's Curled-leaf Tomato; is of a pale yellowish-green colour, entirely different from anything I ever saw before; the stalk short and stout, having the appearance of Vines growing slowly in a drought, while the sorts alongside, with same soil and culture, grew luxuriantly. This variety ripens in September, yields well, and promises to be extra fine for the table, both in boiling and baking. From a single year's trial in its growth I should say that it will prove a Potato of the first class for the table, as we have tested them frequently since they were put in the cellar and always found them excellent.

Snowflake.—This Potato was sent out by Messrs. B. K. Bliss & Sons last spring, and this fall when I dug them, to say the least, I was very much delighted with them, and when tested, either by being boiled or baked, my admiration for them did not at all decrease; and after numerous trials since, I think if they are not the very best Potato I have, all things considered, they certainly are very hard to beat—so smooth, no rot, and are good yielders. I never get such great yields as some persons do, but try to give all new things a fair chance to produce all they can with good soil and cultivation.

Brownell's Eureka is another aspirant for the highest honours, and in yielding properties will no doubt beat the Snowflake, but it is not as smooth a Potato, and has much ranker vines. It is a first-class Potato in quality, either baked or boiled; but on rich ground has grown the past season with me (alongside of the Snowflake, soil and culture the same) with too many prongs or knobs to look as well as it would if it were smoother. No doubt if grown on a moderately rich soil it would grow much smoother than last year, which was very wet in this section till after the tubers were set. I also had a number of other sorts, five or six from California—but must give them another trial, and if not good in my estimation, I shall not recommend them to the public for trial.—J. TALCOTT, in "Cultivator."

THE LATE PEA CROP.

To have Green Peas as early in the season as possible, and late in autumn, is the aim of the Pea grower who has to keep up a successful supply. Anybody may have Peas in July and August, but to have them in May or early in June, and in October and November, requires a little management. The worst obstacle to a successful late crop is mildew, by which, in dry seasons or soils, it is sometimes quite spoilt. In light sandy soils it is often most difficult to escape this disease; while in heavy moist soils it gives little or no trouble. The best preventives are deep trenching, liberal manuring, mulching, and watering. Sometimes late Peas follow early crops of other vegetables that have come off the ground about midsummer; and, though the ground may be trenched, the soil is often then so dry that the top spit, turned undermost in trenching, never afterwards gets thoroughly moistened, and mildew is produced by the very means taken to prevent it. In such cases, therefore, plenty of moist rotten manure should be added. I generally apply thoroughly decayed leaves and litter from the early Vinery borders, adding, at the same time, a sprinkling of lime or lime scraps. This kind of manure once soaked holds a good deal of moisture in suspension, and is very suitable to Peas. It should be spread thickly on the ground and incorporated with the top spit, and if this be dry, it should get a thorough soaking with water when turned in to the bottom of the trench; being immediately covered with the layer of wet soil, the moisture will then be preserved for a time. Of course it is not this watering which saves the Peas altogether, but if it was not given it would be very difficult to soak the soil afterwards. The time to sow depends a good deal upon the variety and the locality. Tall Wrinkled Marrows require from sixteen to eighteen weeks, from the period of sowing till the pods are fit to gather. Here, in a late district, the late crop is always in the ground by the middle of May; it should never be delayed longer. The varieties are generally Veitch's Perfection, Ne Plus Ultra or Payne's Conqueror, and British Queen. The first gathering is ready about the second week in September, but the two last-named kinds often afford gatherings well into November if early frosts do not occur. Much depends upon the season, however, and if we have room to spare, a few more rows of British Queen and Ne Plus Ultra are put in about the end of May; but the crop from this sowing is precarious. Of course, some of the early Marrow sorts may be sown later than this; but none of these are very prolific, and I rather prefer the usual late kinds for the last crop. I have sometimes sown the early Round varieties, such as Auvergne, First Crop, &c.; but they are not appreciated after the Marrows, as they are apt to ripen off suddenly in autumn, and are not to be depended upon. The Marrows are best, and must be sown according to locality. Six feet for such as Veitch's Perfection, and 8 or 9 feet for the latest sorts, should be allowed between the rows; and, to resist the autumn hurricanes, they must be stoutly staked, and afterwards the rows should be well mulched with short Grass or rotten litter, spreading it out 18 inches or 2 feet on each side of the row. If this is done, an occasional watering, if liberal, will serve for a good while; whereas, watering without mulching, in dry summer weather, is of little avail in the case of Peas; for the amount of moisture they absorb in dry weather is prodigious. They are gross feeders and drinkers, as is shown by the state of the soil where Peas have been growing, which is always impoverished and dry. The body of haulm itself on a Pea-row is almost impervious to rain, as anyone may observe; for, after the heaviest showers, the soil in the vicinity of the roots is generally dry, the rain having been thrown off. This dryness at the root, in addition to causing mildew, checks growth, some Peas ripen, while others form slowly, or not at all, and they are never fine-flavoured. I have seen an altogether fresh set of flowers put forth, and young pods form, after a good drenching of rain in October, when this after-growth had apparently come to a standstill. August and September are, however, the months in which abundant waterings are most needed; for the Peas are then about to flower or pod, and just at the stage when keeping the plants in a succulent growing condition is important for the sake of a good crop, and its continuance, which may also be promoted by picking the Peas as fast as they become ready for use, and leaving none to ripen for seed.—"Field."

A TOMATO FOR COLD COUNTRIES.

THE Conqueror is said to be one of the earliest, as well as one of the most productive varieties, in cultivation. In 1869, Mr. Pringle, of Vermont, relying on the opportunity which his residence in the extreme north affords him for the production of very early varieties of plants, set himself to the task of advancing, if possible, the season of maturity of the Tomato, and to the originating of a variety which, even in high latitudes, should produce a crop of ripe fruit before the season of frosts, and which might in more favoured regions

fill a place not occupied by the earliest. Cognisant of a well-ascertained fact in hybridisation, that from the union of two early varieties may issue some which will excel either parent form in earliness, he cross-fertilised the Keyes with pollen of the General Grant. Among the numerous sorts which he raised the next year from this cross, a few gave promise of being earlier than the earliest. A careful process of selection was employed, by means of which the earliest and best of these many shifting forms was seized and given fixedness of character. The fruit of the Conqueror does not remain green for a long time after it has reached its full size, but begins at once to ripen; in this manner it obtains an earliness of maturity which has been some two weeks in advance of the General Grant, and considerably in advance of any of the popular sorts, which have been heretofore considered the earliest, by the side of which it has been tested. This earliness ensures the ripening of the entire crop; which fact, taken in connection with its remarkable productiveness, makes its yield enormous. The habit of the vine is moderately compact. The leaf resembles that of the pollen parent, General Grant, rather than that of the Keyes, on which the seed was borne, and shows much of the curl peculiar to early varieties. The fruit is borne in clusters of eight to twelve, which ripen very nearly at the same time, is of good size, 3 to 4 inches in diameter, round and flattened in outline, uniform in shape and size, and unusually free from irregular or ribbed and crumpled specimens. Its colour is a deep red, minutely dusted with gold. Its flesh is solid, of uniform excellence throughout, of rich, mild flavour. It ripens well up to the stem and is exempt from cracking. Dr. Thurber says "I had over a dozen varieties, including this, among which were several novelties, as well as those accepted as standard varieties. All were treated precisely alike, from the time of sowing to that of fruiting. I think it a moderate statement to say that the Conqueror was ten days earlier than any other in the garden. By earliness I do not refer to the ripening of a single specimen, for the Conqueror ripened one fruit unusually early, but I mean that plants of this would afford a good table supply at least ten days before those or any other variety. I would also add, that in colour, shape, and quality, this variety was highly satisfactory." Seed of this kind is offered in the catalogue of Messrs. B. K. Bliss and Sons, of New York. Dr. Haskins, of Newport, Vermont, says it is "the only Tomato which we have ever planted in Vermont, that has ripened the whole crop and died before the frost." This variety would seem to offer peculiar advantages for open-air culture in England, and we hope it may soon be extensively tried.

Dwarf French Beans.—To have a plentiful supply of these with as little labour as possible, dwarf kinds, which can be grown without the aid of stakes, are the best for all classes of cultivators to grow. Among a number of kinds I have grown for trial I have found none to equal Osborn's Forcing. About 300 pots of various kinds were in full fruiting on April 24, and Osborn's is distancing all the others. Newington Wonder is one which I have grown for many years, and it always gives capital returns, being perhaps the easiest managed Bean in cultivation; and, where a French cook has to turn the produce to account, not only to gratify the palate but to please the eye, he is invariably glad to have such handsome and tender Beans as Newington Wonder at his disposal. Sion House is also one of the best for forcing. I was induced to give Canadian Wonder a fair trial after hearing so much of it, but more especially from seeing it grown to perfection by Mr. Gilbert at Burghley, last year. I have grown it largely, but I have either not treated it skilfully, or may not have secured the true kind.—W. TEMPLE.

Grafting Cabbages.—In reference to this subject (see p. 190), allow me to say that the grafts were placed, some on autumn-planted stocks, and some on early spring-planted ones, the tops of which were cut off level, or nearly so, with the ground; after which the soil was removed, leaving bare that most woody portion of the stem, on which the graft was placed whip-fashion, and simply tied firmly and closely with common bast, so as to exclude air, &c.; the soil was then replaced, at the same time pressed firmly, and allowed to rise slightly above the upper point of contact. As each graft was completed, a 7-inch or 8-inch pot was placed over it, on the drainage hole of which a piece of slate was laid during the middle of the day, the principal object of which was to prevent undue evaporation until the grafts showed unmistakable symptoms of being united, after which the pots were dispensed with altogether. As growth progressed, the pots were, by degrees, elevated from the ground, and a freer circulation of air and light about the plants was allowed. After a few days they were taken off entirely during the morning and afternoon, and only used to shelter the plants for a few days longer from strong sunshine. The stocks were found to require water now and again, and the grafts received frequent light syringings. Any little trouble that attended this part of the business did not extend far beyond a month. After

the union was completed, I had to remove the soil clear of the lower point of connection, to prevent the very great tendency of the scions to form roots, which I considered would, if allowed to grow, spoil the experiment. As regards cross-fertilisation, I had very little to dread on that score, as the nearest garden to me is separated by at least half a mile of dense wood, and in this garden none of the Cabbage tribe or anything is allowed time to flower; but, so as to make assurance doubly sure, I placed, in bag fashion, securely attached to the stem, a covering of fine white netting, through which no fertilising agent could penetrate; by means of cross-sticks fastened to supporting stakes, the covering was kept from coming in contact with any portion of the inflorescence, and it was drawn, by a running string, closely about the main stem.—C. P. in "Gardeners' Record."

New Sweet Corn, Triumph.—This new and superior variety was originated by Mr. Voorhees, of New Jersey, and is the result of ten years of careful cultivation and the selection of seed stock, with the aim of developing the following points of excellence, which are now combined in this variety, viz.: sweetness, earliness—it being the earliest of all the large varieties, and unsurpassed for its richness, sweetness, and delicacy of flavour, productiveness, size of ear, and white appearance when cooked. It has been cultivated as a market variety for several years (though the seed was not offered for sale until last year), and praised by those who have given it a trial. Professor Thurber says—"A single trial of this variety (The Triumph), convinced us of its great excellence, and we regard it as good in every respect."—"Bliss's Catalogue." [This fine early kind should be worth a trial in this country, in which we hope the excellent vegetable delicacy known as "Green Corn" may some day be popular.]

Sprouting of the Early St. John's Cabbage.—Among the seeds distributed by the Royal Horticultural Society in the spring of last year was a Cabbage called Early St. John's. I sowed the seed the latter end of April; it vegetated freely, and, when the young plants were sufficiently strong, they were placed at once from the seed-bed into an open plot in the garden, where, by the end of August, notwithstanding the dry summer, the plants formed heads very regularly, and a series of white solid Cabbages, not very large (the largest not exceeding 6 inches in diameter), was the result. A more uniform bed of Cabbages it would be difficult to conceive, and the regularity with which the plants all came to perfection at the same time was much admired by those interested in such matters. The Cabbage proved excellent when cooked. There is nothing, perhaps, very unusual in this little history, so far; but a change soon took place, and in this manner. When the bed of Cabbages was just at its best, a long, warm, very dry period was succeeded by much rain and a very growing state of the atmosphere. The sudden impulse given to vegetation by this state of things soon caused the solid heads of the Cabbage to burst, and in a few days a series of smaller, well-shaped, rounded, compact heads were formed from the central axis of growth, closely touching each other, and backed up by the leaves of the original head, which remained green and full of sap. The number of these smaller heads varied from three to six in each Cabbage, and proved equally excellent when cooked as the original heads. I am aware that Cabbages often burst in wet weather and spoil; but here the bursting was rather to the advantage of the grower than otherwise, and the regularity of the process was remarkable.—W. S. SAUNDERS.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

White Broccoli.—In reply to your correspondent (p. 376), I would say that there are not many Broccolis in which the sulphur and brimstone colour does not appear. Two, when true, are as white, I think, as can be found amongst all the Broccolis, viz., Cooling's Matchless and Dilcock's Bride; these, cut before they get exposed to light, never fail to give satisfaction. To-day, I have cut some splendid heads of Leamington Broccoli. It has a grand bold head, but it shows the brimstone colour a little.—N. H. P.

—If your correspondent will try the following varieties of Broccoli, true to name, I think they will leave but little to be desired in the way of colour, especially if he keeps the heads well covered up with foliage:—White Cape, Veitch's Autumn Giant, Snow's Winter White, Early Penzance, Dilcock's Bride, Carter's Champion, and Cattell's Eclipse.—B. CALVERT, *Terlings*.

Hardy Kales.—Belgian journals speak strongly in favour of the dwarf and tall green Curled Kales. The past winter left severe traces in the kitchen garden. Broccoli, Brussels Sprouts, and common Cabbage all suffered, the Curled Kale alone escaping injury. The usual precautions were taken to protect the Broccoli, but they were very much injured nevertheless. Here in England, too, the hardy Kales appear to have been neglected of late, but the trying winter we have experienced should reinstate them in favour to the extent at least of providing a supply in case other things fail.—H.

Asparagus in Old Times.—At Ravenna the Romans cultivated Asparagus with most extraordinary results, the stems weighing three pounds each. The same as to-day, they allowed it to boil but a short time, as it was a favourite expression with Augustus, when he wished a thing accomplished quickly, "Let that be done quicker than you would cook Asparagus." The Roman cooks chose the finest heads of Asparagus and dried them. When wanted for the table, they put them in hot water and boiled them a few minutes, a plan good enough to be followed at the present day.—B.

THE HOUSEHOLD.

SCARLET RUNNERS AND HARICOTS.

THE Scarlet Runner, the Haricot, and the Kidney Bean, in all their varieties, are among the most nutritious of human foods. Prejudice, and prejudice alone, has prevented them from being used in England to the extent they deserve. In France, in Italy, and in Spain, they and the Leguminosæ generally form the staple food of the labouring classes. The amount of sanguigenous and respiratory food contained in seeds of this genus is greater than that contained in the best beef, the proportion being also more equal, and requiring less admixture of other food to make up the balance. Thus, while beef contains only ten parts of sanguigenous to every thirty of respiratory food, Peas, Runners, Beans, and Lentils contain ten of sanguigenous to every twenty-two of respiratory food. An Italian writes, in the "English Mechanic," a plea for the increased use of these vegetables:—Having succeeded in growing our Beans, let us notice the best modes of cooking them. For those gathered green, the ordinary method of slicing them in long strips and boiling till tender is very good. When thus boiled, they may be seasoned in various manners—either being covered with a white sauce of melted butter, or by being slightly fried with chopped Parsley, and a suspicion of bacon; or, lastly, made up into a salad with hot oil and vinegar and a slice of Onion, pepper, salt, other condiments being added at discretion. If, however, the seeds are to be eaten ripe—and, for this purpose, the dwarfs are the best—after having been taken out of the shells, they should be placed in a stoneware jar and just covered with water. To each pint of Haricots or Beans, put two ounces of fat bacon, cut into small squares, along with a small sprig of Sage, and a small Onion chopped fine. Place the jar in a warm oven, and allow the Beans to bake till quite tender, adding warm water from time to time to keep them just covered. The liquor produced by the Beans will be found to be quite as palatable as the broth from the finest shin of beef. Or the dry and shelled Beans may be soaked twelve hours in water, and then boiled till quite tender, strained, and made into a salad while hot, with oil, vinegar, pepper, and salt. To correct any tendency to flatulence, which Beans sometimes produce, a clove of Garlic or a Spanish Onion should be sliced up and mixed with the salad.

MODES OF COOKING RICE IN INDIA.

RICE, the staple food of India, is prepared in numerous styles; among these are the following methods, used by the natives of Bengal:—First, paddy (unhusked Rice) is soaked in cold water twenty-four hours, after which it is dried in the sun, and when sufficiently dry to bear the process, is husked in a treadmill. In the process the grain broken by husking are separated by a fan from the unbroken. Second, the paddy is first soaked in water, then boiled, dried, and husked; different varieties require to be soaked for periods of different length. If the paddy is oversoaked, the Rice is dark-coloured; if overboiled, it is coarse in appearance; if overdried, it is much broken. Third, the paddy is parched. In this process the grain in parting with its moisture swells up to about four diameters, becomes very light and white in appearance, and the husk is split and separated from the desiccated, puffed grain. Fourth, "flattened paddy." This is first boiled well, and then, after being slightly dried, under the pestle of the treadmill is husked and flattened at the same time. Fifth, parched Rice. The husked Rice, being slightly wet with water and salt, is placed on a parching-pan or sand-bath (the latter gives a better flavour to the Rice), and being briskly stirred, it immediately swells to about one and a half diameters, and becomes anhydrous and blistered by the escaping moisture. But if the Rice is cured by boiling the paddy twice before husking, then moistening the husked Rice with salt and water and drying it by fire, it is made to contain sufficient moisture to swell the grain when parched to three or four diameters. The foregoing preparations are all white and light. They are eaten generally with salt, pepper, and mustard-oil. Khai (parched paddy) is specially suited for the sick as a healthful, dry, and light food. Confections are made of it with syrup of sugar, syrup of molasses, a variety of spices and condiments, in various forms. Sixth, boiled Rice, called bhat. This is the principle food of the natives. "A Bengali, however richly fed, does not feel satisfied unless he takes his usual bhat; meat, fishes, soups, dols, curries, and chatnies, however varied and nicely prepared, are aids and secondaries to bhat." The modes of cooking boiled Rice, either alone or in connection with other articles of food, as milk, sugar, and almost every kind of indigenous fruit and vegetable, are too many and diversified to afford room here for description. Rice also enters as an ingredient into a great variety of confections.

A DISAGREEABLE CLIMATE.

SOME of the Ontario newspapers are greatly exercised in connection with a few statistics of Canadian temperature forwarded to you from here by "An Exile." Their argument seems to be that such unpleasant facts should not be "permitted" to transpire, lest they should "stop emigration." You are, however, doing a real service to hundreds of persons at home in giving publicity to facts calculated to dispel the "bamboozlements" of paid agents and lecturers. The true test of a climate is not in mean temperature, but in the range of the thermometer, which rises here to 100° in the summer, and falls to 40° below zero in winter. As for variableness, a man who returns home after several years' experience of Ontario will grumble no more to the day of his death respecting the English climate. Almost every variety of heat, cold, wet, dry, wind, calm, and storm is frequently experienced in a day or two. As to the "dry air," it seems to agree with agents better than with horses. The following is from the "Toronto Globe":—"A horse left tied to a post in Guelph the other day during a cold snap was found frozen to death when its owner returned." According to a telegram in the "Toronto Mail":—"On February 10th a man named Wilson had one of his horses frozen to death in the harness while resting on the side of a hill for a few moments near Acton, Ontario, with a load of lumber." As I have seen at least thirty cases of "freezings to death" in some half-dozen Canadian papers during this winter, with "frost-bites" innumerable, I am led to think the emigration agents in England do not know much about our winter. Permit me to supplement "An Exile's" figures with a few others. Mr. S. C. D. Roper, of Mary Lake, Muskoka, Ontario, has a registering thermometer, of which the account is:—"Feb. 5, 26° below zero; Feb. 6, 15° below zero; Feb. 7, 40° below zero; Feb. 8, 35° below zero; Feb. 9, 37° below zero; Feb. 10, 36° below zero; Feb. 11, 3° below zero; Feb. 12, 20° below zero; Feb. 13, 43° below zero; Feb. 14, 40° below zero; Feb. 15, 30° below zero." In Manitoba, Mr. Stewart, signal observer, reports from Winnipeg the following refreshing figures for January, 1875:—"Mean monthly temperature, 15° below zero; highest temperature during the month, 20°; lowest, 41° below zero; highest wind, 39 miles per hour; Feb. 1, 22° below zero; Feb. 2, 24° below zero; Feb. 3, 30° below zero; Feb. 4, 36° below zero." As I see some gentlemen are about to ask subscriptions at home for a Manitoba Emigration and Investment Company, with the usual "£250,000 capital," &c., I invite attention to the above figures. Permit me to add the readings of the mercury at Ottawa, Ontario, the Legislative capital, for part of January and February, 1875:

Date.	Degs.	Date.	Degs.
Jan. 16 ...	24 below Zero.	Feb. 1 ...	0 Zero.
" 17 ...	23 "	" 2 ...	5 below Zero.
" 18 ...	15 "	" 3 ...	3 "
" 19 ...	21 "	" 4 ...	18 "
" 20 ...	15 "	" 5 ...	2 "
" 21 ...	5 "	" 6 ...	34 "
" 22 ...	4 "	" 7 ...	32 "
" 23 ...	14 "	" 8 ...	24 "
" 24 ...	3 "	" 9 ...	23 "
" 25 ...	18 "	" 10 ...	26 "
" 26 ...	15 "	" 11 ...	18 "
" 27 ...	17 "	" 12 ...	36 "
" 28 ...	20 "	" 13 ...	27 "
" 29 ...	14 "	" 14 ...	22 "
" 30 ...	12 "	" 15 ...	12 "
" 31 ...	0 Zero.	" 16 ...	8 "
		" 17 ...	22 "

The above figures are from the "Ottawa Citizen." It will be seen that on February 10th, the day the horse was frozen to death at Acton, the mercury marked 26° below zero at Mary Lake (Muskoka Free Grants). The sufferings of the families of the thousands of men out of work during our Canadian winters, in the single matter of fuel alone, are dreadful. "A Working Man" writes to the "Globe":—"During the night of January 9th many working men in Toronto, their wives and families, felt more intense suffering from being ill-housed and ill-fed than the wealthy feel in a lifetime." Last month an old man named John Granger, having no other shelter than an old hen-house at Hamilton, had his jaw and face so badly frozen that some of his teeth, though sound, fell from his mouth. The "Hamilton Times" of February 2nd says there are numbers in that city similarly destitute."—"Times."

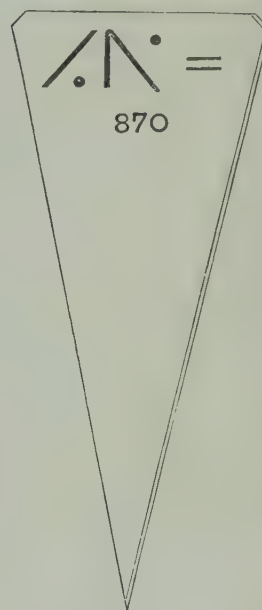
THE USE OF TAN IN GARDENS.

WRITING in the "Revue Horticole," M. Baltet urges the use of tan in gardens, where, he states, it is most useful for covering the walks, the acidity in the material checking, or, indeed, preventing, the growth of weeds, especially where they have first been cleared away. The paths are likewise rendered more pleasant to walk on than on gravel, or on the scoria and shingle frequently used. Too thick a coating should not be given, as this is likely to harbour damp after rain; but this can be remedied by previously spreading upon the ground

a layer of cinders, upon which the tan will rest, and which will drain off the water rapidly and efficiently. The tan should be renewed upon the walks in the spring, as they are much worn in winter. The old material is scraped off and deposited on the borders, where it forms excellent mulching, and may subsequently be incorporated with the soil as a manure; for Strawberry or Raspberry beds nothing is better. In la Brie the white maggot attacks those plants that are mulched with tan less frequently than any others. On the edge of the footpaths the roots of *Abies excelsa* are fond of developing their spongioles in old tan, for it is left for several years upon the less used walks. Some time back, M. Baltet made the following experiment upon a plot of Asparagus. One part of the bed was covered with tan, the other with saltpetrous earth. In the latter portion growth was very vigorous, whilst in the former it was the reverse. Tan, therefore, it may be presumed, is not conducive to the health of Asparagus. An accidental circumstance also showed that a young tree, having its roots dried up or weakened by a long journey, will recover and even throw out young rootlets when the roots have been placed in a heap of tan. An arboriculturist of Troyes, M. Lanier, wishing to re-invigorate an espalier of Pear trees, used a mulching of dung, but being deficient of a proper quantity, he tried fresh tan; and all those trees to which the latter was applied assumed a robust aspect, whilst the others remained unhealthy. M. Baltet states, that he still uses tan in hot-bed frames, mixing it with a bed of earth, and that the kitchen gardeners use it to fill up the paths between the beds; later on, this tan is mixed with dung. At Saint Hubert, in Belgium, gardeners make a good thing out of the heaps of tan from the tanneries; and it seems probable that more will be heard of this vegetable substance.

ZINC GARDEN LABELS.

AFTER trying lead and various other sorts of labels for garden borders, I have found the kind here figured and described the most



satisfactory, as they are absolutely imperishable, and the numbers cannot be effaced; moreover, they do not bend with any slight pressure as leaden ones do. They are made of zinc, are comparatively cheap; and the time occupied in numbering them is short. I find a very convenient size to be 7 inches long, and 2½ inches wide at the upper end. The tools for cutting the numbers are a mallet, a chisel, for the longer strokes, five-eighths of an-inch, and for the shorter one, half-an-inch wide—these should be bevelled on both sides to bring them to a very sharp wedge shape—a bradawl, ground down to form a punch for the circular holes, and a block of wood, on which the labels are placed while cutting the numbers, completes the necessary apparatus. The numbers I use, which are the only ones suitable for this plan, are those first published, I believe, by the late Mr. Loudon; they are easily learnt by anyone, and soon become as

familiar as any other kind of figures; they should be cut quite through the metal.

J. G. N.

I have read Mr. Latimer Clarke's account of his label machine (see p. 315) with interest, and have no doubt that it will answer admirably. But why incur expense, when as good a plan, and one more easily applied, is at hand. I use some thousands of labels in the course of a year, and find that, for ordinary work, zinc labels, with the name bitten in with acid, answer admirably. I make my own labels, and, of course, can manufacture them more cheaply than if I bought them; but, for amateurs, Yeats' labels are all that can be desired. Obtain a shilling bottle of stopping-out varnish from Buck's, or Fenn's, in Newgate Street, a sufficient quantity of labels, some spirits of turpentine, a slate pencil, some pieces of rag or sponge, and some spirits of salts; just touch the face of the label with the acid, wipe it clean, and cover with a thin coat of varnish. With the pencil, finely pointed, write the name on the surface thus prepared, taking care to remove all varnish where the acid is to bite—as otherwise no mark would be made; then pour a few drops of acid on the writing, and let it lie for about five minutes. The acid should then be wiped off with a piece of rag, and the varnish removed with a sponge or rag, saturated with turpentine, when the operation is complete. Labels thus made cost, after they are written, about 3s. 6d. per 1,000, and will last good for nine or ten years.

WALTER J. MAY.

2, Beethoven Street, Kilburn.

THE FLOWER GARDEN.

WINTER ROSES IN THE UNITED STATES.

THE winter production of Rose buds, in the United States, as a commercial enterprise, is a branch of floriculture that has now assumed large proportions, the buds realising from £1 to £1 12s. per hundred. The method of production about New York varies much amongst the numerous growers, some planting out, whilst others prefer growing their Roses in Pots; and the latter is, I think, the preferable plan, as you then have the plants more completely under your control. When planted out, they cannot be rested during the summer months; but, when grown in pots, they can be taken out of doors by the middle of June, rested for a couple of months, and their balls partially reduced. The weak wood is thinned out, and the leaders cut back. The planting-out system may succeed for some years, but eventually the soil becomes exhausted; the buds are only half developed, and the market value is correspondingly diminished. The following is found to be an excellent plan for Rose-cultivation in pots. The cuttings are struck in January, and potted in a 2-inch pot. By March 1st they should be shifted into 4-inch pots, and into 6-inch pots as soon as these are filled. This will be the case about the middle of May, when a hotbed 4-feet deep is made, and on this is placed 6 inches of coal-ashes, in which the pots are plunged to the rim; pure water and liquid manure are given alternately—for the latter, I find superphosphate the best. As their roots are found to fill the pots, the plants are shifted on, and not a single bud is allowed to develop; but they are all pinched off when they are the size of Peas. Upon the prompt removal of the buds depends, in a great measure, your success. If the plants be well-grown, they will occupy 10 and 12-inch pots by October 1, and should be removed to the greenhouse by the 20th of the same month, when they may be allowed to flower. A temperature at night of from 65° to 70° should be maintained, and an abundance of moisture given. Every evening the syringe may be used freely, and the paths should be flooded with water. The method here described is superior to that of planting out. It produces larger buds, and permits the annual renewal of the soil being effected, which is a matter of consideration in Rose culture.

JOHN HOWATT.

Plants Hardy in Gloucestershire.—I think we may now venture to reckon up the gains and losses of the past winter, which I consider to have been one of the most trying that we have had for many years. I therefore send a list of plants of whose hardiness I was doubtful, with the results of the winter upon them. All have been unprotected. The following, I fear, are dead:

Yucca filifera concava Eucalyptus obliqua amygdalina corynocalyx Callitris cupressiformis	Convolvulus Cneorum Statice echioides Salvia taraxacifolia Fuchsia Dominiana	Boykinia occidentalis Modiola geranioides Cheiranthus mutabilis Hypericum balearicum	Heuchera himalayensis Erigeron glaucum Solanum jasminoides (in the open border)
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The following are all alive, though some of them have been more or less injured:

Yucca aloifolia varie- gata Ruscus androgynus Teucrium fruticans Lycium purpureum Edwardsia microphylla Solanum jasminoides (against a wall) Richardia aethiopica Phormium tenax Cneorum tricoccum Mandevilla suaveolens Xiphion Histrio Vallota purpurea Umbilicus Libanotis	Pterostyrax hispidulum Mutisia decurrens Iris fimbriata Pelargonium Endlicherianum Cyclobotrya pulchella Veronica Hulkeana Pistacia Lentiscus Clerodendron Bungei Vitex Agnus-castus Arisarum vulgare Leuzea conifera Polygonum filiforme Philesia buxifolia	Callirhoe involuta Orchis foliosa Tritonia aurea Tulbaghia alliacea Habranthus pratensis Tricyrtis macropoda Saxifraga Fortunei mutata Cyrtomium Fortunei Margaritacarpus setosus Geum capense Lastrea atrata Psoralea Pourcei Kniphofia caulescens	Eccremocarpus scaber Pentstemon Palmeri Phlox pilosa Diplacus glutinosus Hypericum Coris Rubus australis Globularia nana Bellium minutum Bellis rotundifolium ceruleus Eupatorium ageratoides Eulalia japonica Brugmansia sanguinea Geranium tuberosum
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In this list I should like to draw special attention to *Mutisia decurrens*. My plant was a small one, and I was very doubtful about leaving it out; but the winter has not only had no bad effect upon it, but the plant has been actually growing slowly but steadily

all the winter, so that it has now shoots of this year's growth of more than 8 inches. The plant may, therefore, be highly recommended as a hardy climber. Its flowers are very handsome, and its leaves very curious; their shape is very quaint, and each leaf is terminated by a long double tendril. I am so much pleased with the plant that I would try the beautiful *M. ilicifolia* if I could meet with it, but I fear it is very scarce. There are many plants that have not yet sufficiently declared themselves to be placed in either of the above lists; but I can send you a supplemental list if you so wish. I hope others will send you similar lists.—H. N. ELLACOMBE, in "Gardeners' Chronicle."

Culture of Clematises.—Where it can be provided, a rich soil of a light loamy character is the best for Clematises; and if this be mixed, either naturally or artificially, with chalk or lime, so much the better. Thorough drainage is indispensable to good healthy development, and the vigour of the plants must be kept up by at least annual manurings with horse or cow manure. On dry hot soils, cow manure would probably be best; while, on heavy soils, a thorough dressing of good leaf-mould would be beneficial. Mulching with half-rotten dung, on the approach of winter, also tends to increase both the strength of the plants and the size of the flowers. Pruning must likewise receive attention. The varieties belonging to the *Montana*, *Patens*, *Florida*, and *Lanuginosa* types, should be pruned in February or March, when all weak, straggling, or overcrowded branches should be removed. In some of these types, the plants flower from the old or ripened wood; therefore, to secure blossoms, the strong one-year-old wood should be trained in, as far as it has become thoroughly ripened, beyond which it may be cut away, the parts retained being so disposed as to fill up all vacant spaces. The varieties of the *Viticella* and *Jackmani* types are mostly large-flowered summer and autumn bloomers, flowering on the young or summer shoots. In pruning these, the aim should, therefore, be to favour to the utmost the development of vigorous young shoots, and this is effected by cutting the summer growth back each season, as soon as the frosts have disfigured the plants, say in November, to within about 6 inches of the soil.—G. JACKMAN.

Spring-planted Bulbs.—It is generally considered an absolute necessity that all bulbs should be in the ground by the end of October, at the very latest, in order to ensure a perfect display of bloom the following spring. It is difficult, however, to see in what way bulbs are benefited by lying in the cold, damp, and often frozen, ground for three months; for, unless in exceptionally mild winters, no growth is seen above ground until February; therefore, whether such bulbs would not be better in their paper bags in some comfortable place, and planted out about the time they will at once start into growth, is a matter for consideration. I saw a considerable number of Hyacinths, Tulips, and Crocuses on the 1st of February last, the bulbs of which were not of a very superior quality—in fact, had they been planted in October, I should have expected 50 per cent. of them to have decayed in the ground before the end of January; as it was, not one failed. The Crocuses were the first to appear above ground, then the Hyacinths, and finally the Tulips. The Crocuses have been out of bloom for some time. The Hyacinths have been in perfection for the last four weeks, and still present a fine appearance, some of the bulbs bearing two spikes, which, in some cases, are furnished with as many as fifty blossoms. Many of the Tulips are in bloom, and other later kinds bear good indication of a fine display by-and-bye.—J. MUIR.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Geranium Willsi roseum for Vases.—If a little pains is bestowed in tying down and training, these make showy little specimens for drawing-room vases. I have a few now in the room, which are in a blaze of bloom, literally hiding the vases they are in. I can think of no flower which is more pleasing in colour.—J. P. T., *Killruddery*.

Culture of the Flame Nasturtium (*Tropæolum speciosum*).—As I have been told that this *Tropæolum* never does well except in Scotland, I am anxious to know whether it will grow well out of doors in the south of England, what aspect suits it best, and whether a low terrace wall facing due south would be too hot for it.—L. R.

White Camellia out of doors at Bournemouth.—Referring to the note on this subject in the last number of *THE GARDEN*, I may state that there is a very remarkable specimen blooming in the open air at Bournemouth. It grows in the garden in front of Morley House, opposite the Bath Hotel. It is at least 9 feet high and 10 feet through, and during the past spring bore innumerable perfect flowers, in some cases four or five together. It is well sheltered from the north and east by the house wall, and otherwise by shrubs.—JOHN BAIN.

Hardiness of Acacia Nemu.—This has withstood unprotected the test of this severe winter here. We once had (1st of January) the thermometer down to zero; then fine warm weather for several weeks, and afterwards (Feb. 11th) 4° of frost, but neither freezing nor thawing has affected this *Acacia*, the graceful foliage of which gives quite an exotic aspect to the group of plants in or near which it may be planted. It has now been growing here three years in the open air, as a single specimen, and I expect to see it flower this season. It is a fast-growing and handsome plant.—MAX LEICHTLIN, *Baden Baden*.

SOME CALIFORNIAN FLOWERS.

ONE of the most beautiful floral exhibitions we ever beheld, was on the road from Murphy's Camp to the Calaveras Grove. This was about five acres of *Nemophila* in full bloom, making a more compact and beautiful mass than we have ever seen this flower produce, either in Europe or America. On approaching the Grove we saw something that startled us. Near the line of snow—for snow still lingered in the shady places and dells, where it had become piled up during winter storms, we observed several crimson spikes growing from the moist soil. We left the carriage in a hurry, and knelt in wonder and delight before the beautiful Snow Plant, *Sarcodes sanguinea*. This is a parasitic plant, growing on the roots usually of Pine trees. The stem is succulent, all above ground being rosy-crimson, while the portion not exposed to the light is pale pink. The usual height is from 1 foot to 18 inches, but the last number of the "California Horticulturist" describes one recently found near where we first saw them, 28 inches in length, the spike of flowers over 13 inches, and bearing ninety-eight blossoms. The Snow Plant is plentiful in the Sierras.

Bolander's Catchfly Pink (*Silene Bolanderi*) is one of the prettiest wild flowers the tourist will meet with on his travels. The flowers are of the most delicate pink imaginable. When we first saw them in bloom while driving along rapidly in the coach, our first impression was that we had found a new *Lychnis*, after the style of the best cultivated sorts, like *Haageana*; then we thought it must be a Japan Pink, somewhat after the style of *D. laciniatus*. Dr. Kellogg informs us that it was only recently discovered, and considers it a match for the finest Japanese Pinks.

Ithuriel's Spear (*Triteleia laxa*).—This plant resembles the *Agapanthus*, and improves wonderfully by cultivation. It bears a large cluster of flowers, often as many as fifty. The colour varies from Victoria blue to purplish-blue, according to soil, exposure, &c.

Celestial Star Tulip (*Calochortus coerulea*) is a pretty little bulbous plant, light blue, mottled with purple. It has not been cultivated to any extent, we think.

White Tea Tree, or Mountain Birch (*Ceanothus integrifolius*).—The mountains about the Yosemite abound in this beautiful Lilac-looking shrub. Imagine, if possible, that you are on a road out in the mountain side, with a thousand feet of the mountain below, and quite as much above you, and all this, as far as the eye can reach, almost literally covered with white Lilac bushes in full bloom, and you will have something of an idea of what we saw and enjoyed one day, when to relieve the tired and over-burdened horses, we climbed four miles of mountain road. The Mountain Birch abounds in the Yosemite, and many or most parts of the middle Sierra Nevada Mountains.

Twining Hyacinth (*Brodiaea californica*).—Of all the pretty flowers that abound in California, we know of nothing prettier than the twining Hyacinth. The flowers are a very fine pink, or deep rose. It grows in the mountains and twines over every bush it can reach, and the flower-stem goes to the top of the bush to which it is attached, no matter if it is 5 or 10 feet. After it gets to the top of the bush and rests awhile, it lets go of the earth, and goes on blooming and seeding for weeks and months, regardless of the burning sun by day, or the cool mountain air by night. The leaves are long, narrow and grass-like. The roots are very deep, and being entangled with roots of shrubs and bushes, it is next to impossible to get them up. This plant is in flower at all times from May to September. The flower-stem breaks off near the ground, and the flowers are left swinging in the air without any connection with earth or root, supported by the bush about which it twines.—"Vick's Guide."

A Florists' Feast Long Ago.—The following copy of the prize list of a flower show, held many years ago, may be interesting to some of your readers—P. G. "To all Gentlemen Florists.—Your company will be esteemed a favour to dine with the Society of Florists, at the Lion and Lamb Inn, in Leicester, on Monday, the 16th day of April, 1787. Ald. Coleman, J. Newbold, stewards.—The following free prizes will be given:—The best and completest *Auricula*, 10s. 6d.; second ditto, 7s. 6d.; third ditto, 5s.; best seedling ditto, 5s. The best *Polyanthus*, 7s. 6d.; second ditto, 5s.; third ditto, 2s. 6d.; best seedling ditto, 2s. 6d. Dinner to be on the table at two o'clock. The flowers to be the produce of each person's own garden, and the seedlings of their own raising, and never shewn before for a prize. N.B.—All florists to leave the blossoms they shew for inspection of ladies and gentlemen of the town the next day: to be seen at the Lion and Lamb. Gentlemen florists who live at a distance from Leicester to be allowed to shew their *Auriculas* in viols."

NOTES AND QUESTIONS—VARIOUS.

Curious Sport of the Flamingo Plant.—A specimen of this in Mr. Gumbleton's collection at Belgrove, Queenstown, has produced a double spathe. If this remains constant, it will prove an important acquisition.—Q.

A Black Bedding Plant (Coleus Hero).—This was employed very largely last year for bedding, and affords a most striking effect in the flower garden. It makes quite a black bed.—T.

The Scotch Bird's-eye Primrose (Primula scotica).—This is a veritable gem, somewhat resembling *P. farinosa* in foliage. It is now in bloom with me, and has a flower-stalk 2 inches in height, surmounted by half-a-dozen pips that are very small, but perfectly formed, and violet-mauve in colour.—A. D.

Fasciated Double-flowered Buttercup.—I have sent you a specimen of a singular monstrosity which has sprung up in my grounds; in the centre of the plant nearly the whole of the flower-stems (which are much more numerous than usual) are flattish; do you think it worth saving?—Wm. RUMSEY. [As an example of fasciation it is one of the most interesting which we have seen; but it is not worth propagating.]

Peach Shoots killed with Oil.—Dr. Masters showed, at a recent meeting of the Scientific Committee, at South Kensington, shoots of Peach trees from a correspondent who, to remove scale from them, had thickly painted them with colza oil, and allowed it to remain while the shoots were exposed to the sun under glass. The result was that the plant was suffocated and the shoots died.

The Labels in St. James's Park.—Are not the labels in this, and other London Parks, absurdly awkward and needlessly large? The popular name, the scientific name, and the country, are all that are really needed. When there is too much written on a label, especially of such alarming phrases as "an Amygdalaceous tree," they are rarely read. Some of the labels to which I allude are more than a foot across the head.—JOHN BAIN.

Pomegranates without Pips.—M. Béreau, who for several years was gardener to the Shah of Persia at Teheran, states (says M. Carrière in the "Revue Horticole") that in that country a variety of the Pomegranate without pips is frequently met with. It is quite as large and handsome as the ordinary kind, and, in one respect is far superior to it, inasmuch as the entire mass is composed of the luscious pulp which in the common sorts is found in such small quantities, its place being occupied by the useless pips.

Canker in Young Apple Trees.—Allow me to tell "A. B." (p. 376) that I should be disposed to drain the land 4 feet deep, or to where the water lies, and lift the trees so as to get their roots more under the influence of sun and air. With only a superficial knowledge of all the circumstances under which the trees are growing, it is difficult for anyone to speak with decision, but I believe this is what should be done. Canker is either from bad food, or a glut of good food badly digested.—N. H. P.

High-priced Stumps.—Some time in March Mr. Roezl, the well-known plant-collector, consigned fifty-two plants of a rare Cycad, *Zamia Roezlii*, from Buenaventura, to Young & Elliott, seedsmen, of New York. To an ordinary observer they looked like pieces of rotten wood, but when Mr. Elliott offered them at an auction, a spirited competition showed that they were "diamonds in the rough," for some of them, according to the "Agriculturist," brought nearly £7 each. Mr. George Such, of South Amboy, was successful in monopolising the rare lot, except one specimen.

Transplanting Wild Flowers.—In moving wild flowers or plants, always transplant in the twilight. On delicate plants, especially forest plants, this operation can be most safely performed after sundown. If there is light enough to affect a sensitive photograph plate, it will affect the equally sensitive points of the roots. If transplanting cannot be done in the evening, choose the afternoon rather than the morning, and a cloudy or rainy day rather than a bright one. The most fragile plants moved or disturbed after sunset and then freely watered, are often as fresh next day as if they had not been touched, although it is well to take the precaution to shade them for a while.—"Cultivator."

Carter's American Breadfruit Potato.—Inquiries are made about this Potato, which is declared to be without a history, and in want of a character. It really has a history, though it has not yet been told, and Messrs. Carter & Co. may choose their own time for telling it. There can be no doubt it is of American origin, though let out here in advance of its becoming known on the other side, and it is not only possible, but highly probable, it will turn out one of the very finest of the American breed. In all its characters it approximates to *Snowflake*; it has beauty and quality, and a good constitution; and it is, moreover, well adapted for field or garden culture.—"Gardener's Magazine."

Broccoli in Succession.—The following kinds, if true to name, would give your correspondent (p. 376) a good succession of compact white heads from November until June:—*Snow's Winter White*, *Veitch's Early White*, *Dilcock's Bride*, and *Cattell's Eclipse*. Some of the latter should be planted on a north border, to make them as late as possible; and should be succeeded by *Walcheren Cauliflower*, which, sown at the end of August or beginning of September, and wintered under hand-lights or frames, would come into use at the end of May and throughout June. These should again be succeeded by *Walcheren* and *Veitch's Autumn Giant*; sown on a slight hot-bed in February, the *Walcheren* would be in throughout July, followed by *Veitch's Giant* through August and September, and both would be succeeded by the same sorts sown early in April, which would last until *Snow's Winter White* came in, thus keeping up a good supply the whole year, unless destroyed by severe frost. I had a splendid lot of *Veitch's Autumn Giant* throughout last August, and kept some in an early Carrot frame.—J. GARLAND, *Killerton, Exeter*.

Spring Flowering Town Trees.—These are just now so very beautiful that one could wish they were more plentiful in town gardens and squares. The blooming season of the common Almond is over. The snow-white double-blossomed Cherry is very beautiful, contrasted with the deep rosy flowers and crimson buds of the double-flowered Peach and the vivid scarlet *Pyrus* (*Cydonia*) *japonica*, *Forsythia viridissima*, rosy and crimson-flowered *Ribes*, *Berberis Darwinii*, and the snowy *Amelanchier vulgaris* are now very effective, as is also the deliciously-perfumed *Magnolia conspicua*, while *Lilacs* and golden *Laburnums* already give promise of a magnificent show. In some suburban gardens the *Rhododendrons* and *Ghent Azaleas* are glowing masses of the most brilliant colouring, always beautiful in fitful sunshine or when bathed in April showers. One of the freshest and most effective of all spring flowering trees, however, is the Norway Maple (*Acer platanoides*), which has been one mass of the most delicate golden-green flowers; and these, at a little distance, so closely resemble the tender young foliage that they might easily be overlooked. The *Montpelier Maple* (*A. monspessulanum*) also bears golden-green flowers, and both are invaluable for landscape effects in spring.—F. W. BURBIDGE.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

GARDEN LABELS.

It may be useful to divide these into three classes, each having a particular purpose of its own to serve. 1. To indicate a tree or plant by a title that any passer-by may read. 2. To enable the proprietor, or his gardener, to distinguish at any moment one plant from another by merely examining the label. 3. To answer a mere temporary purpose, such as would be required for bedding plants and annuals, until they are disposed of in their respective quarters in the flower garden. Of the three classes enumerated, it is the first only that would require the labels to have a neat appearance, as well as to exhibit the name of the plant in clear and legible characters. Painted wood and iron are the materials often used in botanical gardens and parks, while in private collections labels manufactured in terra-cotta, and in cast white metal with raised black letters, are now more commonly met with; the latter, as sent out by Mr. Smith, of Stratford-upon-Avon, and by Mr. Bell, of Eastbourne, seem well adapted to this particular purpose, and are proof against breakage under the most trying circumstances. On the other hand, the terra-cotta labels of Messrs. Maw, Benthall Works, Broseley, though liable to be broken by careless handling, have this advantage over metal labels, that they can be had either with or without the names painted on them. Next in order come those that are made of sheet zinc, and are written on with a pen. No doubt these can be made to look very neat where appearance is an object; but I put them in the second class, because they are especially suited to mark, in an unobtrusive manner, every description of plant and shrub. Perhaps the best way to attach these (and, indeed, most labels that are required to remain for an indefinite period) is to make, with a short piece of galvanised iron wire, a figure of eight, one loop for the label, the other for the tree. These labels are supplied by Messrs. Carter, of Holborn, and many other dealers; and those manufactured by Mr. Yeats, of Mortlake, Surrey, seem to be of the same character. There is also supplied with them a black fluid, which can be used to write the names with an ordinary pen. The following, too, is a good recipe for making ink for zinc labels:—Verdigris, powdered, 1 drachm; Sal ammoniac, 1 drachm; lamp-black, $\frac{1}{2}$ drachm; water, 10 drachms; the whole well mixed, and shaken before using. I have by me some labels, with names written on them with this ink five-and-twenty years ago, and they are still legible. I have even dug them up uninjured, when they have laid in the ground more than a year. Anyone who possesses a pair of metal shears and a common punch can make these labels for himself out of refuse sheet zinc, which can be had of any ironmonger at less than half the cost of large pieces. I have lately met with a new label made of soft metal, with the name of the tree stamped on it. It is unobtrusive, and, at the same time, not unsightly; and is secured to the tree by simply twisting round it the upper or blank end. It can be attached by the most delicate fingers, and would not injure the tree by undue pressure if it remained so attached for several seasons. For Roses it seems especially suited. This label is the invention of Mr. W. F. Bateman, of Low Moor, Bradford, who is perfecting a machine for stamping them in quantity. In my third class I can mention only the wooden labels in common use among nurserymen and gardeners; and these answer their purpose so well for some departments that I have endeavoured to ascertain at what cost they can be made; for when they are wanted by thousands this is a consideration. I give the result of my experiment. A bundle of laths, called "doubles," can be got for 3s., and ought to contain from 300 to 360 feet run of lath. The bundles vary in length, but those I had by me happened to be just 3 feet long. One of them was cut into eight lengths, each of which was split into six pieces, first by dividing each piece into three in the direction of its

width, and then laying each of the three on the bench and applying the chisel longitudinally in the middle of it. In this way an average of from forty to fifty labels were got from one lath, allowing for occasional failures on the one hand, and additional splittings on the other in those portions where the lath happened to be unusually thick. They were smoothed and pointed with a sharp chisel, and fifty were produced in less than three-quarters of an-hour, and at a cost of less than a half-penny. They averaged about $4\frac{1}{2}$ inches long and about three-eighths of an-inch in width—wide enough for a single name. A few can always be left of double width for more than one line of writing. They can be rapidly painted held three at a time, and white lead, thinned with equal parts of linseed oil and turpentine, applied with a brush on the part where the name is to be written. This can be done either with a common pencil, or with one of Wolff's indelibles, if preferred. Many of these labels will probably be decayed or lost before another year comes round; but the strongest will be likely to turn up again, and they will serve their purpose a second season. When writing on zinc with the fluid recommended, care should be taken that the surface of the metal is clean. To ensure permanency, the label should be well rubbed with emery-paper before the name is written on it. Any of the varieties of label lately recommended in THE GARDEN, I have no doubt, would be found to answer by those who are willing to carry out the instructions given in each case; but I have always found the others sufficient for all purposes. B. S.

THE ROCK-GARDEN IN MAY.

HAVING had the pleasure of inspecting Mr. M'Nab's rock-garden in April, I can easily imagine how beautiful it must be now. Anyone who visited it last month must have been impressed by the beauty of masses of *Scilla bifolia*, and of the richness of *Primula purpurea* and *Iris reticulata*. *Draba aizoides* is also a bright little plant, of a purer yellow than *Gagea lutea*, which flowers at the same time. For some years I have noted the dates on which the first blooms of spring-flowering plants have opened, and I shall be happy to send my notes to you when Mr. M'Nab publishes his. It will be interesting to compare the dates of the east and west coasts, and one can imagine such a record being interesting if the world goes on another 200 or 300 years, as showing the modification of climate. Here is Evelyn's list of "Flowers in Prime, or yet Lasting" in the month of May, as he gives it in his "Kalendarium Hortense:—"Late-set Anemonies and *Ranunculus omn. gen.*, *Anapodophylon*, *Blattaria*, *Chamæiris*, *Angusti-fol*, *Cyanus*, *Cytisus*, *Maranthe*, *Cyclamen* (of what sort could this be?), *Heleborine*, *Columbines*, *Caltha palustris*, double *Cotyledon*, *Digitalis*, *Fraxinella*, *Gladiolus*, *Geraniums*, *Horminum creticum*, yellow *Hemerocallis*, striped *Jacinth*, early bulbous *Iris*, *Asphodel*, yellow *Lilies*, *Lychnis*, *Jacea*, *Bellis* (double white and red), *Millefolium luteum*, *Phalangium*, *Orchis*, *Lilium convallium*, *Span. Pinks*, *Deptford Pinks*, *Rosa* (common, *Cinnamon*, *Guelder*, and *centifol.*, &c.), *Oleaster*, *Cherry-bay*, *Trachelium*, *Cowslips*, *Hesperis*, *Antirrhinum*, *Seringas*, *Sedums*, *Tulips serotin*, &c., *Valerian*, *Veronica* (double and single), *Musk Violets*, *Ladies' Slipper*, *Belvidere*, *Stock-gilly-flower*, *Spanish Nut*, *Star-flower*, *Chalcedons*, ordinary *Crowfoot*, red *Martagon*, *Bee-flowers*, *Campanulas* (white and blue), *Persian Lilies*, *Honey-suckle*, *Bugloss*, *Homer's Moly* and the white of *Dioscorides*, *Pansies*, *Prunella*, purple *Thalictrum*, *Sisymbrium* (double and simple), *Leucojum bulbosum serotinum*, *Peonies*, *Sambucus*, *Rosemary*, *Stæchas*, *Sea Narcissus*, *Barba Jovis*, *Laurus*, *Satyrion*, *Oxyacanthus*, *Tamariscus*, *Apple Blossoms*, &c." The date of this list is 1678. We have largely added to our store of exotic hardy plants during the last 200 years; yet I think comparatively few modern gardens can show a tithe of the plants named above, all of which probably the author grew in his own garden at Wootton. In 200 years hence will there be, do you think, as much fragrance lingering round a list of Mrs. Pollock and Lady Cullum *Geraniums*, *Golden Feather Pyrethrum*, and *Ageratum*, as hangs about this quaint catalogue of old-world flowers?

SALMONICEPS.

NOTES OF THE WEEK.

— MESSRS. BACKHOUSE, of York, have sent us some specimens of the bright and pretty rock-plant, *Cytisus Arduini*, a native of the south of France. It is a hardy and very graceful plant for the rougher parts of the rock-garden, and for beds or borders of choice dwarf shrubs.

— MESSRS. STEWART & SONS, of Dundee, inform us that their exertions to reduce the cost of transit on nursery goods have been successful, and that the several railway companies have agreed to reduce the present rates, after the 1st of June, to what they were last year.

— WE have received from Mr. Hill, Keele Hall, Staffordshire, a bunch of Black Alicante Grapes, preserved on the French plan in bottles of water since the first week of January last. As regards appearance, it was all that could be desired, the berries being plump, sound, and beautifully covered with bloom. The flavour, too, was excellent—little inferior, if any, to that of freshly-cut Grapes.

— AT the last exhibition of the Royal Horticultural Society Mr. R. Dean exhibited a large potful of the Irish Butterwort, in the freshest possible condition. Its delicate apple-green leaves are exceedingly curious, as they have the power of entrapping small flies and other insects. The flowers of this plant are of a rich violet-purple, and the specimen to which we refer was one of the most interesting in the exhibition in question. It is not unfrequently met with in the south of Ireland, especially near Killarney.

— SOME more special prizes are announced by the promoters of the International Potato Exhibition, to take place at the Alexandra Palace on September 29 and 30. Messrs. Bliss, of New York, offer special prizes for three distinct varieties of New American Potatoes that have been offered in commerce for the first time in the years 1874-75, nine tubers of each; and Mr. John Coutts, Covent Garden, also offers special prizes, for three distinct varieties of English Seedling Potatoes not yet in commerce, nine tubers of each. The sum of five guineas is given in each case.

— IN addition to a very large catalogue of American varieties, Grape growers will find much interesting and suggestive matter in the bulky pamphlet of Messrs. Bush, Son, & Messner, of Bushberg, Mo., which we have received this week, who are Vine growers on a very extensive scale. Many of the kinds are figured, and the letterpress occupies eighty double-column octavo pages. Messrs. Ellwanger & Barry, of Rochester, N. Y., send us their unique and very complete "Descriptive Catalogue of Hardy Ornamental Trees, Shrubs, Roses, &c." It is abundantly illustrated, but the cuts do not show the beauty of the fine specimens in their nurseries.

— AT this season of the year all who do not wish the delicate points of good Asparagus to be destroyed in the boiling, should bear in mind that they are never immersed in water by those who understand cooking Asparagus. The heads are all cut as nearly as can be to one length, tied in a compact bundle, and placed erect in the water, leaving about an inch of the tops out of it. In this way the tips of the shoots of even the largest Asparagus are perfectly cooked, and the lower parts are made more tender than they otherwise would be. This is the only way in which the fine examples of blanched Asparagus now in our markets can be satisfactorily prepared.

— WE hear that a building is likely to be erected at Kew to receive the national botanical library and the collections of dried plants, at present deposited in a house which is small and otherwise inconvenient for the purpose. The value of the collections at Kew to working botanists cannot be over-rated, and the manner in which they are arranged is praiseworthy. There is some difference of opinion as to the desirability of amalgamating the collections at Kew and the British Museum. Our own opinion is that London, and London only, is the proper place for the national herbarium; while Kew should possess one in all respects sufficient to assist in the nomenclature of its living collection and for all the other work of a national garden.

— WE have lately received a flowering specimen of the rare and singular *Cypripedium japonicum* from the Colchester Bulb Company, who have flowered it this spring for the first time in Europe. It is a native of Japan, and is well figured by Blume, and also more recently by M. Van Houtte in his "Flore des Serres." The plant is about a foot in height, and its hairy stems, which are as thick as one's little finger, bear two plicate fan-shaped leaves of a bright green colour, rather jagged or erosely cut around the margins. The flowers are solitary on hairy scapes, the sepals being of an apple-green tint; the petals, too, are of the same colour, but are dotted with purplish-crimson at the base; the lip is large, and curiously folded in front, as in the better-known *C. (humile) acaule*, to which it seems most nearly

allied; the colour of the lip is a soft, creamy-yellow, with bold purple dots and lines.

— It is stated by the "Garten Zeitung" that the number of new varieties of Dahlias offered by German growers this year is 530, of which number one grower, Sieckmann, furnishes 405.

— It is proposed at the congress of botanists which is to be held next year at Brussels, to consider a plan for compiling a Hortus Europæus, or systematic catalogue of garden plants.

— It has been arranged to hold an international fruit and flower show at the Alexandra Palace on the 2nd, 3rd, and 4th of September next. A liberal schedule of prizes will be issued in a few days.

— A CORRESPONDENT informs us that a small bed of Lily of the Valley is in flower in a very small court off Fetter Lane, Fleet Street. There is a very healthy bed of the same plant in front of a house in the Harrow Road. It has been in the same position for many years, blooming admirably beside the dusty street.

— PLANTS of *Rhododendron* 18 to 20 feet high at Keele Hall are now covered with thousands of trusses of bloom of various shades, from purple to almost scarlet. This season being a late one they have escaped spring frosts, and are finer than they have been during the last quarter of a century. Sixteen years ago they were in bloom on the 13th of April, when snow laid 6 inches deep on the ground, and the sight of the crimson trusses peeping through the snow was one not readily forgotten.

— It may interest some of our readers to know that the new Judge who has been appointed to succeed Mr. Justice Huddleston in the Court of Common Pleas is the son of the late Dr. Lindley, editor of the "Gardener's Chronicle," and so long connected with the Royal Horticultural Society. Mr. Nathaniel Lindley, Q.C., although comparatively young, was one of the best known and soundest lawyers in Vice-Chancellor Hall's Court, of which he was one of the leaders. He is also the author of an able "Treatise on the Law of Partnership."

— AT one of the recent meetings of the Central Horticultural Society of France Dr. Baillon read an interesting note upon a new kind of *Gymnocladus*, which he had named *chinensis* after its birth-place. This tree, which will probably be hardy at least in some parts of France, has two advantages—it will enrich our collection of forest trees, and promises also to be a source of material wealth from the value of its pods, which are likely to be largely used in the manufacture of soap and similar substances. This interesting discovery was made by M. Payen, who states that this material is used in China instead of soap.

— It is reported that an Italian professor has discovered that perfumes from flowers have a chemical effect on the atmosphere, converting its oxygen into ozone, and thus increasing its health-imparting power. As the result of his researches, he states that the essences of Cherry, Laurel, Lavender, Mint, Juniper, Melons, Fennel, and Bergamot are among those which develop the largest quantities of ozone, while Anise and Thyme develop it in a less degree. Flowers destitute of perfume have no such effect. He recommends that dwellers in marshy or otherwise unhealthy localities should surround their homes with a profusion of the most odoriferous flowers.

— ON Saturday last another large portion of ground on the northern side of the embankment—laid out as a garden—was dedicated to public use by the Metropolitan Board of Works. It extends from the Outram Monument, near the Charing Cross Railway Bridge, westward, as far as the boundary line of the private grounds of Whitehall Place, fronting the Thames—in other words, far towards Westminster Bridge; thus making three public gardens between the Temple and the Victoria Tower. The expense of fencing and laying out the latest addition to these ornamental grounds is understood to have been about £3,000, and the total cost, including the purchase money, between £6,000 and £7,000. The garden is from the plans of the architect of the Metropolitan Board, and the works were carried out by Mr. Meston.

— EXPERIMENTS have been made in Algeria by M. Rivière with the object of making Pears, grafted upon seedlings, fruit sooner than they otherwise would do. The stock upon which it is usual to graft Pears is, as is well known, either Quince or seedling Pears; but the Quince only flourishes in rich, deep soil, and it is comparatively short-lived. On the other hand, the Pear grafted upon a seedling has the advantage of adapting itself to any kind of soil, but it is long before it comes into flower, and its first fruits are bad. M. Rivière set himself the task of uniting the qualities of both kinds of stock, and to accomplish this has cleft-grafted upon seedlings the Quince, and subsequently upon that the variety from which he wished to obtain fruit. He intends making known the result of this operation, which does not appear to have been previously tried.

THE HOUSEHOLD.

CARROT COOKERY.

It may not be unacceptable to your readers to supplement Mr. Guichenon's article on the Carrot, which appeared the other day in *THE GARDEN* (see p. 358), by a few tried receipts for cooking that excellent vegetable. I will begin with Carrot soup, first premising that the French Scarlet variety is the one I prefer for most cooking purposes, although several other kinds mentioned in the article just alluded to are good when carefully prepared.

Carrot Soup.—Take 1½ lb. of Carrots which have been first brushed very clean; then boiled, until tender, in slightly-salted water; mash them to a smooth paste, or rub them through a sieve; mix the paste with 2 quarts of boiling soup (strong beef broth will do); season this with pepper and salt, and add, before being finally boiled up, a small lump of sugar and a piece of butter. Serve with a dish of bread cut into small dice and fried in butter.

Boiling Carrots.—Brush them very clean (a process not always performed with sufficient nicety), or pare them if at all old; divide them, and cut the thick part into quarters, should they be very large; throw them into well-salted boiling water. Old Carrots require from an hour and a half to two hours; young ones are tender in from twenty to thirty minutes. A tureen of melted butter should be served with them. Carrots form a good accompaniment to boiled beef, and it is usual to boil them in the water with the meat; the colour is, however, better if they are prepared separately.

Carottes au Beurre.—Boil sufficient Carrots for a dish until they are quite tender; drain them well, and whilst this is being done just dissolve from 2 to 3 ounces of butter in a saucepan, and strew in some minced Parsley, some salt, and white pepper or cayenne; then add the Carrots, and toss them very gently until they are covered with the sauce, which should not be allowed to boil. Cold Carrots may be re-warmed in this way.

Carrots (Entree).—Select some good Carrots of equal size, and cut the upper parts into even lengths of 2½ inches, then trim the end of each into a point so as to give the Carrot the form of a sugar loaf. When all are ready throw them into plenty of ready-salted boiling water, and boil them three-quarters of an hour; lift them out, drain them well, arrange them upright and all on a level in a broad stew-pan, and pour in good hot beef broth or veal broth to half their height; add as much salt as is needed and a small teaspoonful of sugar, and boil them briskly for half-an-hour, or longer should they require it. Place them again upright in dishing them, and keep them hot while a little good brown gravy is thickened to pour over them. This may be mixed with a little Onion minced and a teaspoonful of minced Parsley, or they may be sauced with béchamel or white sauce.

Mashed Carrots.—Boil and mash some fine red Carrots, and dry them in a saucepan over a gentle fire; mix them with 2 ounces of butter, cut into small bits, keeping them well-stirred. Add salt and cayenne, and serve them garnished with croutons of fried bread.

Stewed Carrots.—Half-boil half-a-dozen large Carrots without cutting them; then slice them into a stew-pan; put in enough good stock to nearly cover them, with pepper and salt to taste. Stew them till tender; then mix in a separate vessel half-a-pint of cream and a table-spoonful of flour, and add to the Carrots with 1 ounce of butter. Boil up and serve. Small young Carrots may be dressed in the same manner, and will, of course, require less time to cook them.

Carottes a la Maitre d'Hotel (a genuine French receipt).—Scrape twenty small young Carrots and wipe them, but do not wash them. Put them into a pan with 6 ounces of fresh butter; cover the pan, and toss the Carrots over the fire from time to time. After a quarter of an hour add salt and pepper, some chopped Chives, and Parsley. Cover the pan and gently toss it again from time to time, until the Carrots are tender. If you use large Carrots, cut them into slices and boil them in water until they are nearly done. Drain them and finish them as above.

Carottes a la poulette.—Take some young Carrots; scrape and wipe them carefully. Put them in a pan over a moderate fire, with 6 ozs. of butter and a tablespoonful of flour; toss them repeatedly,

and take care the flour does not become brown. Pour a tumblerful of milk into the pan, cover it, and let the Carrots simmer slowly until they are done. Then take the pan from the fire, and pour into it two yolks of eggs, mixed with a tablespoonful of good cream, and a little pepper and salt; warm these ingredients, taking care not to let them boil, and serve.

Carottes au jambon.—Put into a pan 6 ozs. of butter and a tablespoonful of flour; simmer these over a quick fire, until they become slightly brown. Add a gill of boiling water, then 6 ozs. of raw ham cut into small dice, a little salt and pepper, a Bay leaf, a small bunch of Thyme and Parsley, a large Onion, and six large Carrots cut into slices the size of a half-crown. Cover the pan, and let the Carrots boil until they are done. Then take out the seasoning, and serve. N. B.—This receipt answers well for Turnips.

Carottes a la Menagere.—Put into a pan 6 oz. of butter and a tablespoonful of flour; stir the flour until it browns slightly, then add half a tumbler of white Burgundy and a gill of broth; add the Carrots, previously blanched and sliced, and cover the pan. Let the same boil quickly until they are sufficiently done; then remove the pan from the fire, and pour into it two yolks of eggs mixed with a few drops of water. Just stir these over the fire without letting them boil, and serve.

N.

BARBE DE CAPUCIN.

THIS, which is Chicory blanché, is a common salad plant in Paris, and, every spring, examples of it, imported from the Continent, may be seen in Covent Garden Market. Its taste, however, is too bitter for most people, and, on that account, the Witloof, which we figured in our last issue (see p. 391), may be expected to supersede it. It is easily blanched, either in the open ground, or in a cellar, and is sold in bunches like that represented by the accompanying illustration.



Bunch of Barbe de Capucin.

BEETLES IN TEA.

I HAVE received communications from three firms, and a sample from one, complaining of the occurrence of beetles in tea, and inquiring what their name is, whether they are of Chinese origin, and what they eat. A few of the details may be given here without mentioning any name except that of the beetle. The single sample

I have examined contained about fifty beetles in the perfect state, and several larvæ of beetles. The former are about the size of grains of wheat, and of a chestnut-brown colour. Some of them were completely clothed with short pale down, the rest perfectly smooth and shining, evidently the result of the down having been rubbed off by continual journeys among the dry and unyielding tea leaves. The larvæ or grubs were nearly white, and there were two chrysalids, also white. The parcel from which the sample was drawn consisted of about a hundred chests, all of them more or less infested with the beetle. The chests had been in a bonded warehouse in London three or four years. It is a very inferior parcel of tea—indeed, one which no respectable dealer would be likely to buy—and, now that it proves to be infested with beetles, it will probably be destroyed. My first object was to ascertain the name of the beetle, my second its country, and my third its food. I will say something on each of these points.

1. The Name.—Directly I saw these beetles I recognised a household pest, called by entomologists *Niptus hololeucus*. In the year 1838 I found similar beetles in an old cupboard at Deptford, in company with sundry and divers boots and shoes that had been laid aside as leaky and useless, and ought to have been thrown away. The beetle was quite new to me, and, being desirous of obtaining a name for it, I took it to Mr. Stephens, then the highest authority on beetle nomenclature, and, to my delight and astonishment, it was pronounced perfectly new. I, therefore, suggested that it should be called *Ptinus holosericeus*; but this name subsequently gave way to an earlier name proposed by Faldermann, and in 1839 it appeared in the appendix to Stephens's "Manual" as *Ptinus hololeucus* of Faldermann; and this name has again yielded to a third, *Niptus hololeucus*, by which the insect is now generally known, although some entomologists have expressed a doubt whether Faldermann's

beetle and the tea beetle are exactly the same, and should it be shown they are distinct, the tea beetle will, of necessity, receive another name.

2. The Country.—As the beetle is now naturalised everywhere, it is scarcely probable that its aboriginal country will ever be made known. It is said to have been introduced into England from Persia *via* Turkey; but, on investigating this report, I can find no confirmation—it seems to have been entirely conjectural. Of course, the fact of its abundant occurrence in tea suggested the idea of its importation from China; but this seems equally unsupported by evidence. Moreover, as the creature was a London pest in 1839, and has remained so ever since, and as it was not noticed in tea until 1874, there seems no good ground for supposing it imported with tea; and there is no evidence to show whether it exists in China, so as to get into tea at its first source. On the other hand, seeing that it is so abundant in Britain, especially, but not exclusively, in London, and that it had enjoyed abundant opportunities for establishing itself in tea that has been bonded in London for three or four years, it seems scarcely reasonable to conclude that it first reached us from China. To prove the negative would be difficult, perhaps impossible; but to establish such a theory it is absolutely necessary that it should have been known as an inhabitant of China before it was observed in London.

3. The Food.—It appears to be omnivorous; it eats tea, linen, wood, oatmeal, bran—indeed, every vegetable substance utilised and warehoused by man for food or clothing; it is also charged with perforating boots and shoes when not in use; leather seems the only animal substance it is known to devour. It is to be found in nearly every printing-office or paper-warehouse, but I have no evidence that it eats or damages papers; and, as to metal type, the compositor might regard it with indifference, and, if he saw it nibbling at a quad or a thin space, exclaim with Junius and with Æsop, “Cease, viper, thou bitest against a file!” It may be observed that several other beetles are equally omnivorous, and therefore cosmopolitan; they accompany man in all his wanderings and migrations, avail themselves of all his means of transport, eat every kind of food that he eats, clothe themselves with the material he selects for vestments, and for repose avail themselves of his dormitory, whether in the hovel or the palace; such, for instance, are *Dermestes lardarius* and *Dermestes murinus*. In conclusion (says Professor Newman, in the “Field”), I may say that I can suggest no remedy; all insecticides must be useless, unless you can persuade the Niptus to adopt them as food in lieu of the various esculents which I have already enumerated as included in his ascertained bill of fare.

WINE WITHOUT GRAPES!

At the session of the International Viticultural Congress, in October, 1874, at Montpellier, France, M. Saint Pierre, professor in the medical school of that city, by invitation, gave some facts in regard to the fabrication of imitated wines, a branch of business which had of late rapidly developed in Hérault, especially at Cette and Mèze. The product of this manufacture is mostly exported, the bulk being sent to Russia, Denmark, Holland, England, and North and South America. Cette alone makes nearly 8,000,000 gallons per annum, worth about 15,000,000 francs. Two-thirds of this aggregate are consumed in America. The only wines that can be successfully imitated are those rich in alcohol, such as the wines of Spain and Portugal. It is not true that Grape juice is the only thing omitted in the composition of these wines, as that is the cheapest ingredient. Nor is colouring matter used to any extent, as the wines to be imitated are white. The Portuguese formerly coloured their wines with Elderwood, but abandoned it on finding that it injured the wine. The imitation of Spanish wines utilises a large amount of cheap wines in the south of France, the production of which has been stimulated of late years. These wines show scarcely 11° of alcohol, but with the addition of syrup of Mulberry and alcohol the strength is raised to 21°. The professor, with great frankness, pleads for the encouragement of this industry. The members of the Congress visited Cette and Mèze, and inspected several manufactories. One of the largest at Cette had then stored over 280,000 gallons in cellars containing from 80,000 to 100,000 gallons each. The total value of the whole deposit is stated at £40,000. The cost of storage, including casks, &c., amounted to £26,000, about 8s. for every twenty-two gallons. At Mèze one establishment astonished the visitors by the vast extent of its cooper-shops, and its steam-engines of great power pumping the wine from great cisterns into the casks.

FLOWERS and fruits are always fit presents: flowers, because they are a proud assertion that a ray of beauty outvalues all the utilities of the world; fruits, because they are the flower of commodities, and admit of fantastic values being attached them.—EMERSON.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

CABBAGES, Cauliflower and Broccoli are all liable, in some gardens, to suffer seriously from the ravages of the root-grub. In old gardens the plants are generally the most affected; and to such an extent, in some places, does this occur, that the summer crops of these vegetables are almost destroyed. Besides the whole or partial loss of the crop, this is very annoying to those who take a pride in seeing in their kitchen gardens that unbroken uniformity in the different vegetables grown that gives evidence of good management; yet, in soils the most infested with these pests, a little extra labour at the time of planting will secure these vegetables, in a great measure, from destruction. At this season amateurs will do well to provide a bushel or two of dry powdered lime, to which an equal quantity of soot should be added; stir the two well together, and keep the mixture anywhere where it will be dry; this quantity will suffice for a good-sized garden. When the different crops for summer and winter use are being put out, use the planting-trowel instead of the dibber, make the holes large enough, and, as the plants are dropped into them, half-fill them up with earth; then, if the weather and state of the soil are such as to require it, give them a good soaking with water, after which put to each plant, all round the stem, a half-handful of the lime and soot, then draw in the remainder of the soil. This simple process will take a little more time than planting without the use of the mixture; but those who use it will be spared the annoyance, through the hot dry months of July and August, of seeing their plants turn that peculiar blue tint in the leaves, and flag in the sun, which is a sure sign that the roots are gone, and that all affected in this way may be consigned to the refuse heap. Where water is given at the time of planting, it is necessary to apply it as above directed, before the lime and soot, as, if the latter is put to the plants first, it will be washed away from the stems, and only have a partial chance of being effectual. The rains we have had lately will now make everything grow apace, and amateurs will find this a busy time; yet the attention devoted to the flower garden should by no means be allowed to interfere with the equally important kitchen garden. The rapid growth that most vegetable crops are making necessitates continual watchfulness. Early Turnips will now require thinning, as also Carrots, as soon as these are strong enough in the tops to draw. It may be taken as a rule that any crop which requires thinning is benefited by this being done as soon as the plants are large enough to handle. We frequently see this deferred until they are so large that their necessary removal always seriously disturbs the roots of such as are to remain. In thinning early crops, especially of such things as Turnips and Carrots, too many should not be removed; for, as soon as they are large enough for use, a portion all over the beds may be gathered, which will give more room to those left to increase in size. Early Carrots 4 inches apart at the first thinning will have space enough. Do not allow Peas to get too large before they are stuck, as, if broken down by the wind, they never take kindly to the supports. As soon as the surface gets sufficiently dry, ply the hoe on all vacant spaces; not only is this disturbance of the soil desirable for the destruction of weeds, but it is also a means of helping the ground to retain its moisture—a matter of great importance in dry situations.

Tripoli Onions Sown in Autumn.—Where large mild Onions are required for cooking, these can only be got by giving them sufficient room. They should at once be thinned out 8 or 9 inches apart, and, if the soil was not sufficiently rich at the time of sowing, the produce will be much larger if it now receives a sprinkling of guano and soot, mixed in equal proportions. Delicate flavoured Onions are much esteemed for culinary purposes; but, unless they are grown freely in soil well enriched, they cannot be had.

Thinning Spinach.—Thin out the early crops of Spinach sown between rows of Peas and in other situations. A not uncommon practice is to leave three times the number of plants of this vegetable that there ought to be, struggling for existence, the result of which is that there is not a single leaf more than half-developed, the whole being correspondingly tough and stringy, running to seed much sooner than it would if allowed sufficient room. In thinning, leave the plants 6 inches apart.

Flower Garden.—Now bed out Pelargoniums, Verbenas, Lobelias, Ageratums, and Petunias, provided these have been sufficiently hardened; but, any plants that have been late struck and not had enough time to prepare them for exposure to the open air, had better have another week's gradual preparation, rather than submitting them to be checked by too sudden a change. In putting out these summer bedding plants, account should be taken of the time when the greatest display will be required. When it is desirable to have the whole a complete sheet of bloom as early in the season as possible, it is necessary to put the plants in the beds much closer than

when the greatest effect is wanted later in the season. In the neighbourhood of London, in most large gardens, if the flower garden is not at its best before the close of the London season its value is, comparatively speaking, lost. In places where the principal display is not wanted before August, the plants should be put in further apart, or they become somewhat exhausted before they are required to be at their best. Amateurs, whose enjoyment of their floral display will, in most cases, be commensurate with the length of time it lasts, will do well to take a medium course in planting. The distance between the plants will in, some measure, be determined by their size and strength when planted, and the nature of the soil. In this style of gardening it is a desideratum to have as good a sheet of bloom on the beds for as long a period as possible, but where the plants are so crowded together they cannot hold out, the foliage of many becoming bad. Individual tastes vary in the arrangement of a flower garden as in other matters, yet there is no reason why anyone should confine his practice to the conventional ribbons, lines, circles, or segments of circles, which it would appear almost impossible to eliminate from modern flower gardening. There were irregular combinations of different colours and plants many years ago that have never been surpassed in pleasing effect. Take, for instance, the beds of Mangle's Variegated Geranium and Purple King Verbena, planted together so as to run into each other as irregularly as possible. This, and many similar mixtures did much to remove the objectionable formality, with reason complained of by many at the present day. It is not alone by a judicious blending of colours in an informal way that summer flower gardening might be stripped of its greatest defects as seen from an artistic point of view, but much might be done in the form and height of the plants associated together. To do this, it is not necessary to plant large coarse-leaved subjects in the midst of low-growing flowering plants. From the wealth of different forms we possess, there are numbers of light plants of elegant habit that would relieve the too even surface of colours in mass, without hiding or unduly shutting out from view all that it is desirable to be seen from any point. The old *Humea elegans*, now put in the shade by plants not possessing half its merit, is one that well illustrates the habit and style of the subjects required for relieving the even surface of form and colour. *Acacia lophantha* is well adapted for the purpose, as also *Cordyline australis*, *Acer Negundo variegatum*, in specimens varying in height from 2 to 4 feet, according to the situation for which they were required.

Herbaceous Plants.—There is nothing like getting the seed of such herbaceous plants as are generally raised in this way sown in good time, by which means they get strong before winter, instead of struggling for existence through the dry late summer months, requiring much more nursing than if they had attained more strength early in the season. Polyanthus, Delphiniums, Sweet Williams, Aquilegias, with a host of similar kinds, if sown at once, will make plants by the autumn, superior in quality to what they would be if the sowing is longer deferred. Sow on a well-prepared piece of ground, with the surface made quite smooth, and cover the seeds lightly with finely sifted vegetable mould; if the situation is a little shaded from the mid-day sun, so much the better; but it should not be where the plants will be weakened and drawn up by the too near proximity of trees.

Watering.—Although the soil is now in moist condition; yet, should we have an absence of rain for even a short time, the ground quickly becomes dry, and surface-rooting plants soon suffer unless water is given them. It is necessary to impress upon amateurs that it never should be given until absolutely required, and, when applied, it should always be in quantities sufficient to moisten the soil as far down as the roots penetrate; when this is not done, it merely excites the surface roots, leaving those that are deeper, and generally of more importance to the full development of the plants, in a comparatively inactive state; and, unless these surface-roots, excited by this sprinkling system of watering, are kept supplied, they perish as quickly as they were formed, in which case the plants so treated suffer more than if no water had been given. This applies with equal force to both flowering plants and vegetables. To all to which water is given, give it thoroughly, even if some things be left without altogether; this will be found better than sprinkling or half-supplying the whole.

Pits and Frames (Cucumbers).—See that these do not become too crowded, by going over them once a fortnight and removing superabundant shoots. Keep the heat sufficiently up by adding fresh hot linings as required. Seeds of Primulas should now be sown, if good plants are to be looked for at the proper season; drain the pots and fill them to within an inch of the top with sifted loam, to which has been added one-fourth of fine leaf soil and some sand; on this sprinkle a little sand, give a moderate watering so as to settle the soil, smooth the surface by gently pressing it with the bottom of an

empty pot, then sow the seeds, over which sprinkle as much sand as will just cover them, and place them in a gentle heat where the surface will not be exposed to the drying influence of the sun, the object being to get the seeds up before much water is required; yet the soil must not be allowed to get too dry. Loose pieces of glass placed over the tops of the pots help to keep it moist. Cinerarias should also now be sown, preparing the soil, sowing the seed, and afterwards treating them as advised for the Primulas.

Flower Garden and Pleasure Ground.

After the middle of this month, it is generally considered safe to commence bedding-out in the flower-garden; and this may, during most seasons, be done without danger, as regards established plants of such kinds as the Verbena, zonal Pelargonium, &c.; while, at the same time, the planting out of the more tender species, such as the Colens, Iresine, Alternanthera, &c., had better be deferred until the last week of the present month, or, if the weather is not then very favourable, it may with advantage be deferred until the beginning of June. Wherever a system of spring-bedding has been adopted, the spring-flowering plants must now be removed to the reserve garden, and the change will this season cause something of a feeling of regret, as the beauty of many early-flowering favourites has not as yet passed away. This is more or less the case during almost every season, but especially in those which, like the present, have been unusually backward. But as regards the parterre, or flower-garden, there must be no compromise, as the time which the seasons allow for the display of summer bedding plants in the open air is too short to admit of any curtailment, and the spring subjects must be at once removed. This removal, however, should be effected with the greatest possible care. In lifting early Tulips, and other bulbs, from the flower beds in an unripened condition, as much soil as possible must be allowed to adhere to them, and they should at once be planted in a somewhat shady situation. After being well-watered, they should be allowed to remain until the bulbs are thoroughly ripened, when they should be cleaned and stored away. As soon as the flower-beds and borders are at liberty, the margins, if of Grass, should be neatly cut with the edging-iron, and the compost, which should have been prepared for them, should now be spread upon the surface of the beds, and well incorporated with the soil, which should be stirred up to a depth of not less than 2 or 3 feet. The compost should also be of a somewhat concentrated and enriching character; for, where the soil is compelled, as it were, to do double duty, liberal treatment must not be withheld. For such plants as the Calceolaria and Verbena there is very little danger of making the soil too rich; and even the tricolor and variegated Pelargoniums, and various other plants grown for the beauty of their foliage, are generally found to be most effective when furnished with a moderately rich and friable soil. But, with regard to the ordinary green-leaved and zonal Pelargoniums, a very rich or highly-manured soil is undesirable, and tends more to the production of foliage than of bloom. It is, of course, supposed that the arrangement of the flower garden, or the manner of planting its beds, borders, vases, &c., was decided last autumn, and that the necessary material has been prepared during the intervening months. In making the necessary arrangements care should have been taken to avoid as much as possible the production of a glaring or too gaudy effect, but rather to aim at a harmonious combination of the various shades, regard at the same time being had to the height and habit of growth of the various plants employed for the purpose, as, however necessary it may be to carefully arrange the various shades of colour, form, at the same time, must not be lost sight of. What are known as sub-tropical plants are generally somewhat tender, and their planting may with advantage be deferred for a short time; and, if possible, the site selected for them should be somewhat sheltered, as they consist principally of species with large and ornamental leaves, which are very apt to be disfigured if exposed too early to cold and boisterous winds. Such plants should be of considerable size when planted, and should have been gradually inured to exposure in the open air. They should be planted in beds of rich or highly-manured soil, and should be abundantly supplied with water during dry weather, in order to induce a rapid and luxuriant development of the magnificent foliage which constitutes their chief beauty, and which, in suitable situations, amid appropriate scenery, seldom fails to produce an effect which is remarkably pleasing. The soil of beds which are to be planted in the "carpet" style should now, after being enriched as may be considered necessary, be also rendered perfectly smooth and level, and the pattern of the bed should be very carefully sketched upon the surface of the same with a pointed stick, or some similar instrument. Well-rooted cuttings and pricked-out seedlings will be found to be better suited to this style of planting than larger plants turned out of single pots. Plants shaken out of store-pots should be pricked out into the beds some-

what thickly, in order to produce immediate effect, spaces being left for such tender species as the *Alternantheras*. In this style of planting it is quite necessary to observe the greatest exactitude and neatness, as, without this, every attempt will be sure to prove a failure. The plants should be well watered with a fine rosed watering-pot as the work proceeds, and for this purpose Le Butt's patent watering-pot will be found to be exceedingly serviceable. Shrubberies are now gay with flowering shrubs of various kinds, including the early-flowering *Rhododendrons*, *Azaleas*, *Kalmias*, &c., and these during dry weather should be well supplied with water at their roots, otherwise their flowers will not last long. Many of the hardy herbaceous plants which usually occupy the margins of clumps and belts of shrubs and ornamental trees, will now be in bloom, and may require to have their shoots and flowering-stems regulated and tied up. These matters should not be neglected during the busy season of planting out, as such flowering plants tend very considerably to supply any want of bloom which may exist during the interim between the two periods of spring and summer bedding. About this time all kinds of Pine and Larch seed should be sown; before consigning the latter to the ground the seed should be put in "steep" as it is commonly termed, that is, spread on the floor to the depth of 10 or 12 inches, and completely saturated with water; the seed should be turned regularly twice or thrice a day for a week or so, by the end of which time the grains will have swelled gradually and the "eye" have become more prominent; many failures in Larch seeds germinating occur when this operation is not carefully attended to. All herbage in young plantations must be cleared off, and all seed-beds weeded; young weeds coming up must be watched and caught in the act, and the pruning of all evergreens finished.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Roses.

Pot Roses that have been forced during the spring and winter months will require a little attention at this season, so as to prepare them for another winter. The whole of the pot Roses whose flowering this season is finished should be carefully re-potted in fresh loam and rotten dung, mixed with plenty of sharp sand. In potting Roses at this season of the year, as much as possible of the old or sour soil should be very carefully removed from the roots by a sharp-pointed stick, without breaking them. The pots must be all well washed inside, as the same sized pots do for many years for pot Roses. The two sizes I recommend are Nos. 12 and 8. In some cases larger pots are required for strong-growing Roses, such as *Maréchal Niel* and the *Hybrid Chinas*. The drainage must be thoroughly attended to. To drain a pot well, the bottom crock should fit as evenly as possible, so as not to allow any space for worms to get in. Afterwards, about 1 inch of small crock shreds or charcoal must be placed over the bottom of the pot, so as to form an even surface, and then some turf fibre or rough pieces of turf should be laid on the top, so as to keep the fine soil from being washed down between the crocks. In watering, much depends on the drainage of pot Roses to ensure success, for pot Roses become sickly, and finally die, owing to stagnation occasioned by bad drainage. In potting the Rose, if a plant worked on the Briar stock, it does not matter how deeply it is planted, as the Briar grows under any ordinary treatment; but if Roses are on their own roots, care should be taken not to pot them too deeply; for the soil, if raised up too high, often causes a Rose to shank off close to the top of the pot. I have also noticed other stocks go the same way. The plants should all be removed to a shady place for a few weeks, till they have made fresh roots. Hybrid Perpetuals may be placed out of doors altogether. Tea Roses require a cold pit. Turf pits are best for them, and a little leaf mould may be mixed in the soil for them, as they require much lighter soil than Hybrid Perpetuals, if they are on their own roots. Take off all flower-buds, and cut out all strong rampant shoots, which rob the plant of its strength to flower another season. If they are allowed to grow, the plant will not break well for forcing; the small shoots are much weakened by their growth, and the plant becomes completely spoilt in shape.—H. G.

Indoor Fruit Department.

Vines.—Planting out young Vines in a growing state is a system which may be practised with the best results. Those propagated from eyes this spring are the most suitable for the purpose; with these I never knew a failure to occur; but that cannot be said respecting those grown in pots the preceding season, cut back in autumn, and planted while making their second year's growth. The latter are generally stronger than the former, but a healthy shoot, 4, 5, or 6 feet in length, with abundance of fresh, fibrous, uncoiled rootlets, makes a substantial and sure formation for immediate and future success. The exact time to plant is not of much importance. It may be done now or any time between this and the middle of

July; but, of course, where the space is empty and the Vines ready, there will be nothing gained by waiting. Vines raised in boxes and root-pruned by cutting the soil and roots into squares, as previously advised, are best for this sort of planting, as they can be lifted and planted without ever being placed in pots, which sometimes interferes with the right direction of the roots. Those propagated in pieces of turf have the same advantage. If the plants have been confined to pots, which is a common way of growing them, the ball and roots need not be much disturbed in planting. Any which have begun to take a circular course should, however, be uncoiled and placed in such a direction as to enable them to extend readily into the border. Planting may be done in the same way as that recommended some time ago for one-year-old canes. Watering must be punctually attended to in order to prevent the foliage from flagging; and should extremely sunny weather set in, a shading of thin canvas should be used during the hottest part of the day. With a little attention, the whole matter may be performed without the Vines sustaining the slightest check, and by autumn they will be a twelvemonth in advance of what they would have been had they been retained in pots this season and planted out next spring. Among Black Grapes for a small house, Black Hamburgh and Black Alicante are most suitable, and among white kinds Duke of Buccleuch and Trebbiano. The first named, both black and white, will ripen with little attention by the end of June, and the other two will keep in good condition, if protected from frost and damp, until February. For a mixed early house, on a larger scale than that just alluded to, Black Hamburgs, including Muscat Hamburgh grafted on the common kind, are most suitable; and, among white sorts, Duke of Buccleuch, Duchess of Buccleuch, Foster's Seedling, Royal Muscadine, and Buckland's Sweetwater. For a late mixed house, Lady Downes, Alicante, Gros Colman, Barbarossa, Mrs. Pince, and Black Prince are the best black varieties, and Pearson's Golden Queen, Muscat of Alexandria, Syrian, Trebbiano, and Raisin de Calabria, the best white sorts. The first house may be made to furnish ripe fruit from the middle of May to the end of September, when the late Grapes will maintain the supply in a moderate way until well into spring. Some dislike growing many varieties in one house, but some of the finest Grapes in the country come from houses planted with miscellaneous kinds. Where many Vineries exist each house may be planted with a different variety, but that is the exception rather than the rule.

Pines.—In addition to the insects mentioned at p. 327 as being injurious to the Pine, ants, which are plentiful in many places, are often troublesome in the case of Pine fruit. They do not meddle with it while green, but when ripe they either make holes for themselves to get into the heart, or enter by the rents which frequently occur in over-ripe fruit, especially in the White Providence and Prickly Cayenne varieties, and it is difficult to get them cleared out when once they get established in such quarters. Their numbers may be greatly thinned, however, by placing a few saucers containing treacle or honey near their runs. Where such enticing traps are employed they seldom pay much attention to the fruit. A sponge soaked in either of these sweets serves the same purpose, and when filled with ants the latter may be destroyed by immersing them in hot water.—J. MUIR.

THE WOODLAND.

Yon woodland, like the human mind,
Hath many a phase of dark and light;
Now dim with shadows wandering blind,
Now radiant with fair shapes of light;
They softly come, they softly go,
Capricious as the vagrant wind,—
Nature's vague thoughts in gloom or glow,
That leave no airiest trace behind.
No trace, no trace; yet wherefore thus
Do shade and beam our spirits stir?
Ah! Nature may be cold to us,
But we are strangely moved by her!
The wild bird's strain, the breezy spray,
Each hour with sure earth-changes rife,
Hint more than all the sages say,
Or poets sing, of death, and life!
For, truths half drawn from Nature's breast,
Through subtlest types of form and tone,
Outweigh what man at most hath guessed,
While heeding his own heart alone.
And midway betwixt heaven and us
Stands Nature, in her fadeless grace,
Still pointing to our Father's house,
His glory on her mystic face!

—PAUL H. HAYNE.

THE FLOWER GARDEN.

CLAPHAM'S STRAIN OF MIMULUSES.

I HAVE now in flower a number of plants of this robust and fine strain of Mimuluses. They were sent me, in the form of small cuttings, early in the year; but they are now about 12 inches in height, and as much in diameter, having large foliage and stout erect stalks. The flowers are large and exceedingly beautiful, with markings that rival the showiest forms of the *Calceolaria*. Some have yellow grounds, others white, and the markings vary from specks of maroon to blotches and belts of deep maroon-crimson. I can best compare the flowers for size with those of the single *Petunia*, which they greatly resemble, but far out-rival in gorgeousness. These Mimuluses are so fine in appearance, that they merit cultivation even as show plants. My plants of them are now turned out of pots into a cold frame, and are afforded, in rough weather or on cold nights, the protection of the lights, and during the day, if needed, a slight shading; but, if dull quiet weather prevails, they may be exposed altogether, and in this position they are doing wonderfully well. Very shortly I shall plant out a large bed of several hundred plants of them in the open ground, to test their usefulness for summer decoration; and I am in hope that they will thrive and answer well. When grown under glass, Mimuluses delight in a cool temperature, and in an abundance of moisture; indeed, in habit of growth and manner of rooting from the side shoots, they resemble the *Water-cress*, and might be almost termed semi-aquatic. Seeds of them sown in a pan and placed in an ordinary greenhouse-temperature will germinate freely, and these will produce plants to flower by the middle of May. Cuttings of them should be put in in the autumn to maintain the stock through the winter, and these will afford an abundance of fresh cuttings for propagation again in the spring. When well rooted, the plants may be potted into 48-sized pots, and, later in the season, from these into 24-sized pots, in which they will make fine specimen plants. If circumstances will admit, the pots would be better, if set on ashes; but, if they must be placed on shelves, it is desirable that saucers should be used, as the roots are gross feeders, and like an abundance of moisture. When the pots are well filled with roots, a little weak manure-water may be given with advantage.

A. D.

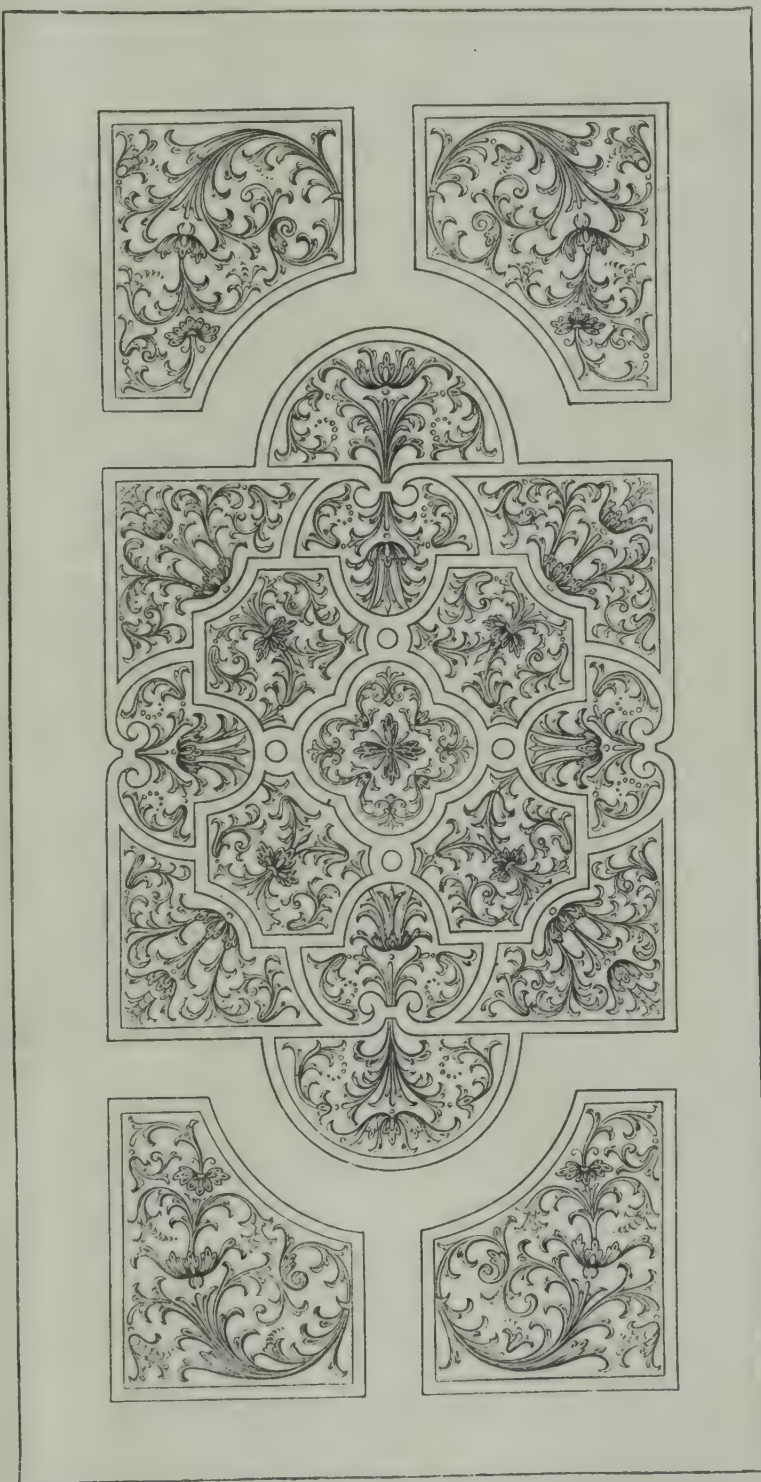
Unmown Grass Margins.—

Instead of the usual prim Grass margin and strip of bare dug earth, I find it much better to allow the Grass to grow freely for a few feet around the margin of the shrubs, like a piece of wild meadow. Given proper preparation of the soil at first and established shrubs, one may grow in such garden meadows many of the most beautiful hardy plants, and they will look lovelier in such a position than in the ordinary prim borders or beds. This plan is best with a shrubbery irregular in outline, and with well-grown shrubs boldly relieving each other, the Grass running in around them here and there, and forming little bays. The soft effect of the long Grass amidst the flowers, and of the "Silver-spoons," as the children call the flowers of the various Grasses, seen against the dark-leaved shrubs, are happy additions to the charms of a quiet garden. The Grass need not be mown till it begins to fade in summer or early autumn, by which time both plants and Grass may be cut down

without injury. Great numbers of bulbs and hardy plants make and ripen their growth in spring and summer. Where Asters and autumn-blooming plants are placed in the wild garden, it is, of course, indispensable to select positions that need not be mown at all.
—ALFRED DAWSON, *The Cedars, Chiswick*.

A PARTERRE IN THE SEVENTEENTH CENTURY.

THE accompanying engraving represents the plan of a parterre at St. Germain-en-Laye, designed by Boycran in 1653. It is a fair example of one of those old gardens which disfigure, even to the present hour, many a country seat on the Continent. This style of scroll-gardening was revived in this country by Mr. Nesfield; but it is not destined to have any real success, either here or elsewhere. It is almost impossible to arrange plants in such gardens so that they may prove permanently satisfactory and interesting; and we doubt not that most of them, new and old, will one day or other share the fate of the abolished scrolls in the Royal Horticultural Society's garden at South Kensington. Contrary as this style is to modern notions of garden design, we nevertheless think it well to give two well-engraved illustrations of it (from Didot's "*Manuel de l'Amateur*"). A dozen years ago some gardens of this kind were being made, and it was not unusual to hear it spoken of as a new style; though, as the illustrations now given, and many others will show, it is as old as it is useless and ill-adapted to modern requirements.



Parterre at St. Germain-en-Laye.

Planting the Flower Garden.—

The time has again arrived when this must be done, and the transfer of the plants from their winter and spring to their summer quarters should now be accomplished. To set the plants upright, and give them a good hold upon the ground, is the first step towards making them grow freely and causing them to cover the garden with beauty. Neglect to take this precaution, and failure probably will ensue. Many of what we call bedding plants, for want of a better name, have their roots compressed into hard balls or a matted mass of roots and earth. The roots have been accustomed to a high state of compression, when suddenly they find themselves in a soft bed of earth, as unlike the old compressed state as can be. The consequence is that they often refuse to grow. The best remedy for the severe check to growth resulting from the roots refusing to bite the new soil is to slightly disturb and loosen the compressed balls, and press the new soil firmly against the roots. The boot-heel of the old planters was a reckless, heartless instrument of root torture; but it had one merit, it made the earth firm, and those roots that escaped destruction fastened on the new earth at once. Firm pressure with the hand, to be supplemented by the consolidation of a heavy artificial watering answers admirably. Again, plant deeply. Most bedding plants may be put in, say, 2 inches lower than they have been in pots; the only exceptions are some of the more delicate *Pelargoniums*, which seem as sensitive as to their "collars" not being buried as if they were rare *Conifers*; but the usual run of bedding plants root upwards as well as downwards and to the side, and may safely have 2 inches of friable soil over the top of their roots. This layer of earth wards off drought at first—a point of great importance; and by the time the leaves take this

duty the whole of it will be occupied with surface feeders. Finally, plant thickly and keep reserves in hand in case of accident. An average of from 6 inches to a foot is suitable for most bedding plants. Sub-tropical plants are different, and will need from 2 to 6 feet to exhibit their goodly proportions. It is easy to thin flower beds, but almost impossible to patch them up, by adding to them, without marring the symmetry of form or colour of a well-filled flower garden. Therefore, plant thickly and thin quickly, if need be, and of course none but healthy plants ought to be planted.—F.

The Evening the best time for Transplanting Wild Flowers.—I found out long ago, quite by accident, that the best time for transplanting wild plants was the twilight hour. I was making a bank of wild flowers at the bottom of my garden, and as I drove home one evening through a shady lane I saw some fine Fox-glove plants (I always carried in my country expeditions a small basket and large knife), and as all those my servant planted the previous week had faded, I took up a fresh stock and put them in directly I got home. They thrive well, so did every other small delicate wild flower I had collected in the same ramble; whereas, those put in the ground during the morning always died, despite better soil, careful watering, and shade. I also noticed the same thing in regard to Lemon Thyme, which is a capricious kind of herb at the best of times, and one about which the Welsh are superstitious. I never, however, knew it fail to take root if transplanted in the twilight.—H. E. WATNEY, *Upper Norwood*.

BEE FLOWERS.

THE following is a list of plants suitable for bee culture, excluding those commonly grown in the kitchen garden and orchard, compiled by Dr. Münter, Director of the Botanic Garden of Greifswald:

I.—From March 1 till the middle of April.

Erythronium	Corylus	Sambucus	Aubrietia
Dens-canis	tubulosa	racemosa	columnæ
Scilla	Primula	Cornus	deltoidæa
amœna	officinalis	mas	microstyla
Galanthus	Lamium	Ribes	Corydalis
nivalis	maculatum	sanguineum	cava
Leucojum	Pulmonaria	Viola	solida
vernum	officinalis	odorata	Eranthis
Crocus	Symphytum	Saxifraga	hyemalis
vernus	orientale	cæspitosa	Helleborus
Daphne	Petasites	hypnoides	niger
Mezereum	niveus	Arabis	
	officinalis	alpina	

II.—From the middle of April until the end of May.

Taxus	Primula	Fraxinus	Geranium
baccata	officinalis	Ornus	phæum
Picea	Auricula	Cornus	Viola
alba	Galeobdolon	mas	odorata
Erythronium	luteum	Ribes	Arabis
Dens-canis	Lamium	sanguineum	alpina
Scilla	maculatum	aureum	Aubrietia
amœna	Salvia	Saxifraga	deltoidæa
Hyacinthus	pratensis	hypnoides	columnæ
orientalis	Symphytum	cæspitosa	microstyla
Ornithogalum	orientale	crassifolia	Barbarea
nutans	Anchusa	Amygdalus	vulgaris
Fritillaria	officinalis	nana	Lunaria
imperialis	Myosotis	communis	rediviva
Galanthus	sylvatica	Persica	biennis
nivalis	Petasites	vulgaris	Corydalis
Leucojum	officinalis	Prunus	cava
vernum	niveus	armeniaca	solida
Crocus	Taraxacum	Mahaleb	Helleborus
vernus	officinale	Orobis	foetidus
Polygonum	Sambucus	vernus	Adonis
Bistorta	racemosa	Æsculus	vernalis
Daphne		Hippocastanum	
Mezereum			

III.—From the beginning of June till the end of July.

Allium	Salvia	Valeriana	Ruta
Schœnoprassum	pratensis	officinalis	graveolens
Fritillaria	verticillata	Diervilla	Dicamnus
meleagris	Betonica	canadensis	Fraxinella
Lilium	officinalis	Lonicera	Althæa
Martagon	Melittis	Periclymenum	officinalis
Asphodelus	Melissophyllum	Caprifolium	rosea
luteus	Origanum	Cratægus	Reseda
Polygonatum	creticum	coccinea	odorata
officinale	Onites	nigra	Sinapis
multiflorum	Digitalis	lutea	alba
Iris	purpurea	spinosissima	nigra
graminea	ambigua	Fragaria	Isatis
germanica	lutea	chilensis	tinctoria
pallida	Veronica	grandiflora	Papaver
Sibirica	latifolia	virginiana	somniferum
Polygonum	Polemonium	Cytisus	Mahonia
Bistorta	cœruleum	Laburnum	Aquifolium
Rheum	Syringa	Robinia	Aquilegia
undulatum	vulgaris	Pseud-Acacia	vulgaris
Rhaponticum	persica	Pavia	Thalictrum
Populus	Centaurea	flava	flavum
balsamifera	Scabiosa	carnea	aquilegifolium
Armeria			
maritima			

IV.—From the end of July till the middle of September.

Anthericum	Borago	Sanvitalia	Spiræa
ramosum	officinalis	procumbens	hypericifolia
Gladulus	Cerithe	Ageratum	chamædrifolia
floribundus	major	mexicanum	Rubus
gandavensis	gymnandra	Helenium	odoratus
Lilium	Hydrophyllum	pumilum	Rhus
candidum	virginicum	Silphium	typhina
Polygonum	Phacelia	amplexicaule	Balsamina
Sieboldii	congesta	Cephalaria	hortensis
Cannabis	Nolana	transylvanica	Linum
sativa	paradoxa	Scabiosa	perenne
Statice	Convolvulus	lucida	Melanthus
Limonium	tricolor	atropurpurea	major
Lavandula	Ipomœa	Sicyos	Lavatera
officinalis	coccinea	angulata	trimestris
Dracocephalum	Asclepias	Bryonia	thuringiaca
moldavica	syriaca	alba	Kitaibelia
Salvia	Campanula	dioica	vitifolia
æthiopis	Medium	Heuchera	Kœltreuteria
hispanica	pyramidalis	americana	paniculata
Monarda	carpatia	divaricata	Reseda
didyma	Lobelia	Sedum	odorata
punctata	Erinus	Fabaria	Hesperis
barbata	Solidago	Portulaca	matronalis
Kalmiana	virga-aurea	oleracea	Bunias
Teucrium	Senecio	Lythrum	orientalis
chamædrys	sarracenicus	salicaria	Macleaya
Leonurus	Helianthus	flexuosum	cordata
Cardiaca	annuus	Godetia	Delphinium
Pentstemon	argyrophyllus	albescens	Ajaxis
barbatum	Tagetes	Clarkia	grandiflora
Nicotiana	patula	pulchella	Nigella
rustica	Echinops	elegans	sativa
Tabacum	exaltatus	Enothera	damascena
macrophylla	sphærocephalus	Lamarckiana	hispanica
Physalis	Centaurea	Epilobium	
Alkekengi	moschata	angustifolium	

ROTATION IN FLORICULTURE.

MUCH has been written in regard to the value of a rotation of crops upon the farm, and I am inclined to think it is just as essential in floriculture. Without attempting to discuss the theories advanced in regard to the exhaustion of certain elements in the soil by certain plants, or the poisonous excretions of others, I think, as a source of variety, rotation may be introduced into floriculture with beneficial results, and I have in my mind certain country gardens situated near a road that I have travelled for a great number of years, all of which would be much improved by a rotation or at least a variation of crops. It appears to me that the same dozen or more of Zinnias, large double Marigolds, clump of Hollyhocks, two or three crimson Petunias, and perhaps a half dozen scarlet Pelargoniums, have occupied the same spot every season during the period named. Now I have no objection to these good old flowers, but to see them in the same identical spot, "for ever and ever," without the least change of position, becomes painfully monotonous. To see a single row of tall, slender Zinnias, or big double Marigolds, or plants of the same, scattered here and there among border plants, is enough to make one feel lonesome, through sympathy, but to see the same inartistic arrangement repeated for half a lifetime in the same garden, is enough to make one wish there was a society to prevent cruelty to plants, as well as animals. While I am about it, perhaps I may venture to suggest to my neighbours and the rest of mankind, that it is possible to make a change in the appearance of one's garden every year without any change in the kinds of plants cultivated. The Coleus this summer may be planted where the Pelargoniums were last, and the Petunias in the Verbena bed, and so on through the entire list. These changes in arrangement will doubtless strike your old visitors as a decided improvement upon that of last year; besides, a change in the soil may be very beneficial to the plants. Next season the reverse of this may be adopted if no better arrangement can be devised, thereby securing rotation and variation in appearance without incurring any extra expense.

Do Some one thing Well.

In gardening, as in many other occupations pursued for pleasure or profit, there is a tendency to spread capital and labour over too large an area to ensure anything like perfection in any one thing. The mistakes made by the amateur florist are usually of a similar nature to those who commence studying natural history with the expectation of going over the whole field very thoroughly, but find, to their dismay, that a lifetime will not suffice for investigating the members of many a single genus or family of plants and animals. Many take more pride in the number of species and varieties of plants cultivated in their gardens than in the quality or perfection of the same, which I think is a mistake, leading to more disappointments than true progress. Better grow a few plants well, than many indifferently, is a far better motto for professional as well as amateur florists. To use a common phrase, a person, to acquire great success, must make

certain plants a "hobby," devoting extra care to their culture in order to ensure extra results. I know that it is very difficult to make a selection of a few really good kinds of plants, when there are so many named in our seedsmen's and florists' catalogues, and perhaps all equally desirable under certain circumstances; still perplexities on this score can readily be avoided by following the "hobby system," that is, making a few a speciality each year, or for a succession of seasons until one has thoroughly mastered the difficulties which may appear in this matter. Some of the best displays I have ever seen of certain classes of plants, were produced by this plan. One of my neighbours for the past two or three years has made the culture of Petunias a hobby, and another pays especial attention to the Pelargoniums; the success in both instances is a marvel to those who spread an equal amount of skill and labour over a greater number of kinds, and less upon any particular genus. Of course neither of the persons referred to omit the culture of everything else except their specialities; but the plants named receive the largest share of attention, and the results justify the expenditure. From my own experience, I conclude that this plan of special culture of a few kinds of plants at a time will give greater satisfaction to the cultivator than the more usual one of attempting to introduce everything which may be highly recommended. There are, it is true, a few kinds of plants which are always desirable, like the best Roses, hardy herbaceous plants, and ornamental shrubs; but among the annuals, biennials, and tender "bedders," there is abundance of room for carrying out our hobby to an almost unlimited extent.—Correspondent "Moore's Rural."

Triteleia uniflora.—For Winter and Spring Decoration, this well deserves a place in the front rank among winter and spring-flowering plants. I know of no other flowering bulbous plant that continues to blossom so long, commencing, as it does, about the middle of January and keeping up a succession of handsome pale blue flowers until May. The blossoms are about 1½ inches in diameter, and are borne on stems 9 inches or so in height, well thrown up above the foliage, rendering it admirably adapted for bedding purposes, edgings of beds, masses or clumps for mixed borders, and shrubberies; in fact, it is suitable for any situation, and thrives well in any ordinary garden soil, requiring no protection from frost. For bedding purposes, the bulbs should be planted in October or November, about 2 inches apart, and 3 inches deep. For borders, make a drill 3 inches deep and 3 inches wide, plant the bulbs in two rows, 2 inches apart, and 2 inches row from row. Where it is convenient to let them remain in the beds undisturbed year after year they increase rapidly, and produce flowers in great profusion. This *Triteleia* is also valuable as a pot plant, either for conservatory or window decoration, during the winter months when flowers are scarce. For this purpose, plant from six to twelve bulbs in a pot, according to the size required, and place them in a frame or greenhouse in September or October to flower from December to March.—W. BROOKS, *Weston-super-Mare*.

The Petra Plant, or Spanish Dagger (*Yucca longifolia*).—Professor Buckley, in "Our Home Journal," states that this resembles *Yucca aloifolia*, except that *Y. longifolia* has leaves nearly one-third longer, and a larger and more showy bunch of terminal flowers; besides its lower leaves are often pointed downwards. It is quite common in Western Texas, west and south-west of San Antonio, where it often attains the height of 15 and 20 feet. It is also found in the mountainous region of San Saba and Burnet Counties, where it is smaller—seldom more than 10 feet high. Late in March and early in April it has a large terminal bunch or raceme of white or creamy-white flowers, each of which is about 3 inches in diameter. It was first described and named in the proceedings of the Academy

of Natural Sciences of Philadelphia, in 1861, and is now admitted by botanists to be a very distinct species.

New Tea Roses.—In a recent election of Roses, Catherine Mermet, was placed, by a large majority of electors, amongst the best twelve Roses known; and that it is one of the very finest varieties we have there can be no sort of doubt. Probably, if all the good qualities it possesses are taken into consideration, it will be acknowledged to be the best of all the Teas. It is large, of the finest form, constant, and floriferous. As a pot plant it is a good healthy grower, and makes sufficiently strong though not large wood. Probably it would be a more robust grower in the open air budded on the Briar, which suits most Teas better than any other stock. Though the blooms vary more or less in depth of colour, the prevailing tint is flesh-coloured rose, with a dash of yellowish-buff. There have been several fine additions to the Tea-scented section within the last two or three years. The cream of these are probably comprised in the following:—Amazon, Anna Olivier, Catherine Mermet, Cheshunt Hybrid, Duchess of Edinburgh, Madame Bérard, Madame Camille, and Madame F. Jamin. Amazon does not seem to be much known, but it is a good and distinct flower, with a long pointed bud, which opens well, and is fine, bright, clear yellow in colour; it is a good healthy grower as a pot Rose, and flowers freely. Anna Olivier is a

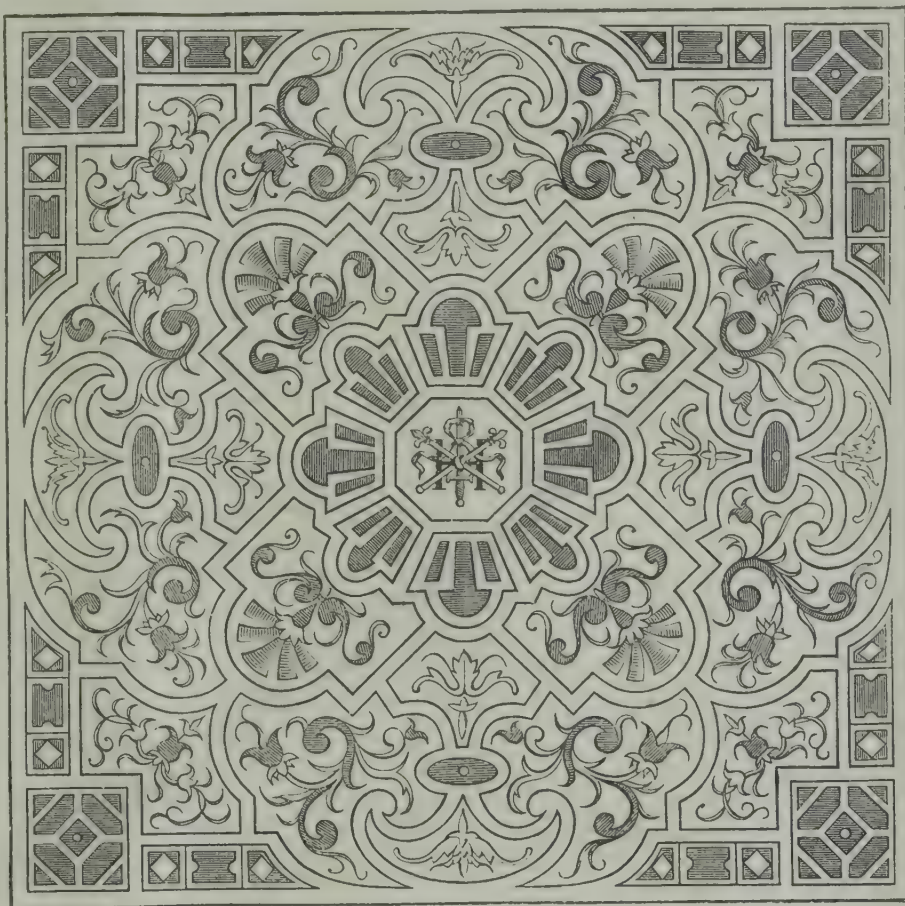
first-rate flower, of good size; the petals are creamy-white, their base deep rose; it is most distinct and pleasing, and is a healthy grower. Cheshunt Hybrid and Duchess of Edinburgh are dark red Teas; the first has the better form, the Duchess is rather brighter in colour, but both are good and valuable additions to the Tea section. Madame Bérard may be shortly described as an improved Gloire de Dijon, which is not saying a little in her favour. Madame Camille is sometimes extremely fine, but it is a somewhat uncertain variety; if it could be always depended on, it would run Catherine Mermet very close. Perhaps one of the most distinct new Tea Roses we have had for some time is Madame F. Jamin, a small Rose, indeed, but most beautiful; in colour it is deep orange-yellow, inclined to copper colour; in habit it is robust and healthy, and it is most floriferous; as a button-hole Rose it is the best of all.—"Florist."

Rhodanthe Manglesii fl. pleno.—A double-flowered variety of this elegant little Composite, already so popular,

cannot fail, if constant in its character, to attract the attention of the horticultural public. How far this double character is fixed, I am unable to affirm from my own experience, but the seed is stated on respectable authority to yield thirty to forty per cent. of double flowers, and may reasonably be expected to become more fixed with each season of cultivation. In a lithograph sent out by the introducer, the entire body of yellow disk florets is represented as transformed into rosy ligulate florets, resembling the ray-like inner scales of the involucre.—W. T.

Double White-flowered Clematis.—I have sent you a bloom of a Clematis for inspection which is said by all who have seen it to be the best white kind in cultivation. It is a free bloomer and does not grow at all large. Perhaps you will kindly give your opinion of it and advise me as to the best way of propagating it.—W. PALMER, *Holyhead Road, Handsworth*. [The bloom sent is like that of *C. Fortunei* or *Lucy Lemoine*. Your plant may be increased by being layered or grafted on *C. Flammula*.]

Moricandia arvensis.—I should be glad to learn the European distribution of this local plant. I met with it in the Riviera in January last, in the neighbourhood of Ventimiglia, beautifully in flower. It belongs to the Cruciferae, and would seem to be nearly allied to the genus *Brassica*. The flowers are deep lilac, the calyx itself being coloured; the leaves are glaucous and stem-clasping; the pods are four-edged, the seeds slightly winged, and arranged uniseriably in the pod. Reichenbach, in his "Flora Excursoria," states that it occurs in Liguria, especially round Ventimiglia and Nice. Wood, in his "Tourist's Flora," also mentions Ventimiglia as a locality for the plant, though he adds that it is found in Provence and Sicily.—PETER INCHBALD, *The Lodge, Hovingham, York*.



Parterre in the time of Henri IV. of France (see p. 403).

TREES AND SHRUBS.

TREES IN THE WESTERN COUNTIES.

MANY, in giving an account of their rambles through the valleys and woods of Hereford, Gloucester, and Worcester, have described the ancient trees in these counties, and notably amongst others the great Eastwood Oak upon Lady Emily Foley's property, but the subject is not yet threadbare. At this season of the year, when fruit and other trees are one mass of bloom, the beauty of the landscape, and the large amount of historical interest that attaches to many of the natural objects in the counties just named, will repay those who have time to wander at their leisure through woodland scenes that rival the most beautiful in the kingdom. Leaving the Eastwood Oak on the left, and bearing to the right from the Hereford and Ledbury road, some finely-wooded country is passed through; but it is not until one comes to the parish of Dymock, in Gloucestershire, that an opportunity is afforded of measuring some of the fine Oaks and Elms which may be seen growing there in all directions—some in hedge-rows, and others standing isolated in the midst of fields. One growing in the centre of a meadow belonging to Mr. Thackwell, was 24 feet 6 inches in circumference. The village of Dymock is said to have derived its name from the colour of the wood of the Oaks grown about that part—the name being, in fact, a corruption of the words "dim Oak." Passing on through Donnington, there are still some fine timber trees—one Elm, on Mr. Webb's property, being nearly 30 feet, and an Oak some 20 feet in girth. Near this are groups of Scotch Firs on the Haffield estate, which constitute land-marks for miles around. They were planted to form screens on the east and west boundary of a rising knoll where, generations ago, a Vineyard existed—and even now one can trace the terraces where the Vines were planted. So far as I can judge, the space between the two groups is about 12 acres in extent. Cherries now occupy the place of the Grapes; but the spot still retains the name of the Vineyard Bank. In the old farm buildings, there was a wine-press, so there can be no doubt that, in former times wine was made from the Grapes grown there. These groups of Firs are certainly very fine, especially those of the eastern group which numbers over forty trees, many of which would furnish quite 100 feet of timber. They are from 90 to 100 feet high, and have 60 feet of a clear trunk to the branches. I took the girth of two; one was 8 feet, the other 8 feet 4 inches in circumference. From this bank you get a fine view of part of the three counties; also, a little to the east of this, is Haffield Camp, considered to be an outpost of the Roman camps, one of which is at Wall Hills, near Ledbury, 3 miles in a north-west direction, and the other at Bransill, 3 miles in a north-east direction; the three forming an equilateral triangle. Though planted with timber and ornamental trees, you can still trace the outlines of these ancient military positions. This also happens to an interesting neighbourhood for geological research. In Haffield Park the pebbly shore of an ancient sea-beach is to be seen, and instances have not been wanting of the discovery of those strange and mysterious boulders, which differ in every respect from the surrounding formation, and which science tells us were ice-borne from other parts, at an epoch when our waters were those of the polar sea, and our animals and flora those of the arctic circle. Growing near this I found a specimen of the true *Quercus sessiliflora*, measuring in girth 16 feet. R.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Berberis Darwinii.—This, when in bloom, if planted by the thousand, as it is here, gives a finished appearance to the shrubbery. Pegged down, it also makes a brilliant bed at this time of the year.—A. HENDERSON, *Thoresby, Notts.*

Pyrus (Malus) floribunda.—Amongst hardy flowering shrubs this stands pre-eminent just now; it should be used largely in shrubbery borders, as it flowers in the form of small plants, and is not at all particular as to situation. A large plant here is surrounded by tall Oaks, and is just now one mass of bloom.—A. HENDERSON, *Thoresby, Notts.*

Colletia horrida.—Flowering specimens of this spiny and somewhat formidable-looking shrub have been sent to us from Belgrove, Queenstown, by Mr. Gumbleton. Its little pink and white bell-shaped flowers, borne in dense heads, give it, when in blossom, a striking appearance, and render it worthy of more attention than it generally receives.—Q.

Salix rosmarinifolia.—This is a Willow worthy of a place in the front of shrubbery borders; it was in full flower during the last days of April. Its catkins, which are of a rich golden colour, are produced in great profusion, and it makes a fine associate for such shrubs as the Flowering Currant, the foliage being distinct and beautiful.—OBSERVER.

New Zealand Trees.—The climate enjoyed by New Zealand trees is a still and moist one, without frost; and give them that, they will grow almost anywhere. I tried repeatedly to grow the beautiful Rimer (*Dacrydium cupressinum*) as a detached tree, but it always grew sickly until it was planted amongst a thick mass of other shrubs and kept from the wind and sun.—H. W.

THE GARDEN OF ALCINOUS.

HOMER, in his sublime works, has left us what are evidently faithful descriptions of the gardens of Greece in heroic times, and, amongst others, of "that of Alcinoüs, King of the Phæacians, which was said to have been several acres in extent, and surrounded the palace. It was encircled by a hedge, and in it many kinds of trees grew—the Apple, the Pear, and the Orange, charming to the eye and scented, as well as the Fig and the evergreen Olive. These trees, in winter and in summer, were invariably laden with fruits, some of which were developing from the bud whilst others were ripening. Flowers in the vineyards were mingled with the Vines. The garden was bounded by a plot, where the greatest order reigned, and where, throughout the year, the cultivation of numerous plants was carried on. Two fountains were in the garden, the one serving to water the soil, the other, flowing in the direction of the palace, was for the use of the citizens. These were the gifts with which the gods endowed the dwelling of Alcinoüs." When the Greeks had reached that state of civilisation which was never equalled by any race of antiquity, they did not fail to learn from their rivals, the Persians, their system of garden management, which was sufficiently good to elicit the warmest admiration of Xenophon and Lysander. It is not to be wondered at that the Greeks sought to imitate that which appeared so wonderful to them. In applying their skill to this kind of work, they could not equal the luxury of the Persian gardens, but they could show that they were superior to their rivals in elegance of taste. It does not appear, however, that they devoted themselves to horticultural art in the same manner as they did to architecture, and their historians speak of no one garden especially worthy of being remarked. The Greeks, at the zenith of their prosperity and civilisation, were always more celebrated for their architecture than for horticulture, and the partial development of the art of gardening in ancient Greece is to be attributed to a variety of causes, as, for example, to the limited extent of territory, and, again, to their manners and customs, and to their political and social state. These small states, for the most part, had essentially democratic constitutions—no kings, few wealthy people, none of the magnificent palaces to which gardens are usually attached. It is, however, probably to Greece that we must look for the first instance of public gardens, created by the authorities for public use, such as those of the Academia and of the Lyceum at Athens.

Propagation of *Garrya elliptica*.—I have frequently used the flowers of this plant in the way spoken of by Mr. W. Divers (p. 322), and I find them very useful. After repeated trials, I think that the best way of striking the cuttings is to get some good sharp red sand, and with it make a solid bed, 9 or 10 inches thick, raking the top level, and pressing it smooth with the back of a spade. Then procure some good well-ripened shoots, and make them into cuttings, 6 inches long, taking care to give them a clean cut under a joint. Cut off all leaves except three or four of those at the top, make a nick 4 inches deep across the bed of sand with a spade, and put the cuttings in 3 inches apart; press the sand firmly round them, and again level the top. Proceed with the next row, 4 inches apart, in the same manner until all are put in. Place over them hand-lights, or a shallow frame, and keep them close, except in mild weather, when they may have a little air once or twice a week to expel dampness. Place good thick mats over the glass in frosty weather; and, during the warm days of spring, give them air as early in the morning as possible, sprinkling them slightly when the sun breaks through, and then closing and shading them, to prevent their being scorched. As spring advances, and they are safe from frost, remove the lights in the evening, and give them water in the morning if required; then replace the lights, and shade as before. This treatment may be carried on through the summer; and when the hot days are over, the plants will bear free admission of air. Throughout the winter, remove the lights, if possible, once or twice a week, and put mats over the glass on frosty nights. In the spring, they may be taken up and potted into large 60-sized pots, three parts of loam and one part of rotten dung and red sand being used. Plunge them in a bed of ashes, where they can be shaded from the sun until they get established, and be protected from spring frosts; after which they may be repotted and plunged in any common garden soil.—C. R. H., *Abbeyle House, Sheffield.*



IDEAL VIEW IN A GREEK GARDEN.

THE FRUIT GARDEN.

FRUIT TREE CULTURE ON A LARGE SCALE.

By C. BALTET, Troyes.

FOR some time past there has perhaps been too great a tendency on the part of fruit growers to regard merely beauty and regularity of form in their trees. Their chief desire is to secure a handsome tree, well proportioned and symmetrical, its fruit-bearing capacity being apparently a matter of minor consideration. The tree that does not naturally answer the requirements of its owner in this respect is tortured, mutilated, and perhaps eventually replaced by another, and thus many years are lost before it is got into a condition to produce good crops, that is, an abundant and constant supply of fruit. Instances, unfortunately, are only too common, where orchards almost abandoned to Nature yield more than the most carefully tended fruit gardens. At present the demands consequent upon a large consumption of fruit are on the increase; I cannot, therefore, too earnestly recommend all who have waste lands under their control to plant them with fruit trees, which will succeed on mountain slopes, in rows along the sides of roads, by river sides, on railway banks—everywhere in fact, where the character of the soil and climate is suitable; and, above all things, care should be taken to plant kinds only which are certain to thrive, and whose produce will have the best chance in the market. When once the kind of fruit for any particular soil has been determined, the different varieties of it to be planted may be selected; and I may just mention that it is of the very highest importance to have hardy, vigorous, and fruitful trees whose fruit will ripen when the market is not overstocked. One often meets with indigenous varieties of fruit, the cultivation of which does not extend beyond the limits of a certain village. Their produce is certain and their sale assured. If their fruit be good they may be used with confidence, supposing always that the orchard to be planted possesses soil and climate of a similar kind. Instead of multiplying the number of kinds of fruit trees for cultivation, we should rather recommend their reduction, unless the object in view is merely the supply of one's own table. In that case, the number of varieties may be enlarged, in order that we may have kinds that will ripen successively throughout the entire season.

The Apricot.

This likes a light, warm, sandy soil and a sheltered situation. It thrives in good garden ground, but dreads a cold, close, water-logged soil. The blooming season is so early, that it needs protection in spring. In France, it thrives admirably in the mountains of Auvergne, in the Burgundy, Lyons, Bordeaux, and Anjou districts; to the northward, on the plains of Triel, near Paris; to the southward, near the shores of the Mediterranean. In Lot et Garonne, the village of Nicole has Apricot orchards on its steep hill-sides that are exposed to the south, but sheltered to the north. These annually produce 100,000 francs worth of Apricots, which are sent to the Bordeaux markets. The neighbourhood of Dijon produces an early Apricot that is much prized for eating. In the market, its rivals are the Apricots of the south and of Algeria, which are more pleasing to the eye, but less satisfactory to the taste, and less sought after by good judges. The best Apricots of French origin are the Gros Saint-Jean, which ripen early; the common sort used in the making of Apricot pies; the Royal, a fruit much used; and the Pêche de Nancy. The latest, but most valuable, Apricot trees are grown as standards, and may be moderately pruned; but, generally speaking, they are left to Nature, no attempt being made to give any particular direction to their branches. Planting them on high-lying ground ensures well-ripened wood. They should be grafted on the Plum. In the south, they graft them upon the Almond and upon seedling Apricots, and very often the Apricot is reproduced by means of seed.

The Cherry.

The Cherry tree, when grafted on the wild Cherry, will thrive in rich cool ground; when grafted on the Mahaleb it will succeed in arid, strong, calcareous soil; and, when grafted on the seedling Cherry, it will thrive in silicious sandy soils, and sometimes in damp ground. It is only swampy, cold, clayey soil that proves prejudicial to the growth of the Cherry. The roots of this tree have but little disposition to strike deeply into the earth; therefore, great depth of soil is a matter of little importance. The situations best adapted to the Cherry are high-lying ground, slopes, and plains, where there is plenty of light and where the air has free circulation. In the vicinity of a forest or confined in a wood the Cherry tree shoots up and produces but little fruit, and that little is exposed to the depredations of birds. Cold localities, subject to fog, are unfavourable to Cherry culture, as are also too warm and dry situations. At Saint Bris, in France, where Cherry brandy is made, Cherries to the value

of £4,000 a-year are grown on less than 230 acres planted with May Duke. Cherry trees should be planted as standards, either in clumps, on plains, or in hilly ground, upon waste lands, and upon railway embankments. All dwarf Cherry trees are grafted in France upon the Sainte Lucie variety. Standards should be grafted upon the wild Cherry for planting in good soil, and upon Sainte Lucies for dry, light, and mediocre land culture. The principal varieties are—The Early English or May Duke, Empress Eugénie, Late English, Montmorency, Reine Hortense, Belle de Chatenay, Black Griotte, Early Guigne, Ohio's Beauty, Rose Bigarreau, Red Bigarreau, and Black Bigarreau. It is not necessary to prune the Cherry tree; occasionally the young sprouts may be cut back, but the stronger and older branches should not be cut. Montmorency Cherry trees in Champagne are, however, pruned decennially without disadvantage.

The Pear Tree.

This likes a good deep soil; dry warm ground is not favourable to its growth, and ground, on the other hand, that is too damp is equally prejudicial to the tree. An open argo-silicious soil, or one of a fertile, ferruginous, light, and somewhat cool character, or where a calcareous rather than a turfy loam is to be found, proves suitable for these trees, always supposing that the top soil is deep and the sub-soil permeable. The Pear tree lives under difficulties in a latitude hotter than that of the south of France. In Algeria it becomes scorched and dried up by the winds of the desert. On the other hand, too cold a climate is inimical to its successful cultivation. In warm countries, therefore, the Pear tree must be planted upon the northern slopes of hills and upon flat open ground; in cold localities it should have a position where it can be reached by the sun's rays—in gorges, for instance, where the air and heat are concentrated, and upon plains at a sufficient altitude to render any fear of stagnant damp needless, but not so high as to expose it to cold currents. As in the case of other fruit trees, its vicinity to a stream of water is favourable to its fertility. The number of varieties of Pears cultivated is very considerable, a fact concerning which it is easy to satisfy one's self by visiting the markets of large towns and country orchards. All over the Continent one meets with a profusion of Pears bearing unknown names and doubtful in quality; all these are not adapted for growing as standards. In some the fruit is too large, or adheres badly to the branches; others require an annual pruning, which it is impossible to apply to full-grown trees. One constantly meets amongst the early varieties some which cast their fruit or which ripen too suddenly; others, on the contrary, retain their fruit till it ripens on the tree. In modern times much attention has been paid to winter Pears for dessert; but good returns can also be had from summer or autumn kinds. They ripen when fruit is much in demand. Keeping Pears are unsuitable for standards, because they are comparatively valueless when bruised. In spite of the importance of the nomenclature of Pears, whose ripening commences at the beginning of June and ends in the spring of the following year, our list of orchard Pears is somewhat short. We must not, however, forget that, wherever good local kinds are to be found, although not mentioned here, they may be made use of, provided their sale can be depended on. One meets with l'Echassery and the Bon Chrétien d'Été in Switzerland, the Forelle in Germany, la Charbonnière in l'Ardèche, l'Épine Dumas at Limoges, la Poire de Prêtre in Champagne and Burgundy, the Deux Yeux in the district of Lyons, the Roussette in the Côte-d'Or, the de Fosse in l'Aube, the Herbin in Picardy, the Torpes and the Mantivelle in Saône-et-Loire, the Bergamotte d'Été in Chartrain, the Saint-Michael Archange at Nantes, the Bési de Quessoy and d'Héric in Brittany, and the Mouille-Bouche at Bordeaux. Amongst extraordinary instances of production, it will be sufficient to state that at Publier, in Savoy, there exists a tree that produces 150,000 Pears every year; near Meaux, a Carrière Pear tree which produces annually Pears to the value of £6; in Cher, a Cogné, which is equally valuable; at Presles, in Brie, there are Rignault Pear trees of which the crop is worth £4,000; at the foot of the Alps, the Royale d'Hiver has produced fruit to the value of £32 from two trees (this case, probably an exceptional one, occurred at Monétier-Allemand, in the Commune de Ventavon); at Varennes-lès-Beaune, a small inferior early tree, with fruit of a bright colour, brought in £4; at Troyes, the product of three trees of Bellissime d'Été brought in £20; at Saint-Trond, in Belgium, the Koolstok (Cabbage Stump) produced £4,000 annually in the country, and gave rise to the establishment of a new industry—that of basket-making and the cultivation of Osier-beds. The following is a list of good orchard Pears:

Summer Pears.—Doyenné de Juillet, Citron des Carmes, André Desportes, Espargne, Beurré Giffard, Blanquet, Docteur Jules Guyot, Boutoc Beurré d'Amanlis, Rousselet de Rheims, Monsallard, Madame Treyve, Doyenné de Mérode.

Autumn Pears.—Beurré Hardy, Beurré Superfin, Beurré d'Angleterre, Louise-bonne d'Avranches, Beurré Capiaumont, Beurré Dumont, Marie-Louise, Doyenné du Comice, Emile d'Hyst, Fondante Thirriot, De Tongre, Beurré d'Apremont, Alexandrine Douillard, Figue d'Alençon, Beurré Bachelier, Madame Bonnefond, Triomphe de Judoigne, Beurré Diel, Fondante du Panisel, Beurré Baltet Père.

Winter Pears.—Beurré d'Hardenpont, Passe-Colmar, Curé, Sœur Grégoire, Beurré Millet, Nouvelle Fulvie, Marie Benoist, Doyenné Boissard, Chaumontel, Passe-crassane, Royale-Vendée, Beurré Rance, Joséphine de Malines, Doyenné d'Alençon, Olivier de Serres, Beurré Perrault, Bergamotte Esperen, Doyenné d'Hiver.

Cooking Pears.—Pears for cooking or stewing should find a place in every orchard. They are invaluable in certain culinary preparations, and in this way are used largely in some districts. Amongst the best of this kind are Certeau d'Automne, Messire Jean, Martin sec, Catillac, and Sarrasin. We have not mentioned the Belle Angevine (Uvedale St. Germain's), a Pear that holds the first place as regards beauty, but the last for quality; it is a showy fruit, and keeps well from year to year. It is capable of acquiring magnificent proportions, and succeeds well grafted upon the Quince tree. Thus produced, a fine specimen of the Belle Angevine variety will easily sell in Paris for 16s. In vacant spots in orchards, whether amongst the large trees or in the shape of an orchard fence, it is possible to cultivate a large number of good dessert Pears, and we may add the following varieties, remarkable for their productiveness, their beauty, and their general good qualities; the trees adapting themselves to cultivation either as half-standards or dwarfs:—William, Clapp's Favourite (an American kind), De l'Assomption, Souvenir du Congrès, Van Marum, Colmar d'Arenberg, Nouveau Poiteau, Fondante des Bois, Sucrée de Montluçon, Duchesse d'Angoulême, Beurré Clairgeau, Beurré Six. In favoured situations, or under the shelter of a wall, there may be planted Beurré gris, Doyenné blanc, Crassane, Saint-Germain, Royale d'Hiver, Doyenné d'Hiver, Bon Chrétien.

Pears for making Perry.—Pears for making perry are an important fruit from the beverage they furnish, which is one resource that countries deprived of Vines can fall back upon. It would be difficult to state precisely those kinds most adapted to the manufacture of perry, as they are differently named in each country. We give the names of those most noted in Normandy:—Carisi, de Blanc, de Chemin, de Cheval, de Cloche, d'Entricotin, de Fer, de Hie, de Noir, de Normandie, de Sauge, Gros-Blanc, Gros-Vignon, Gros-gris, Longue-Queue, de Loup, Picard, Sabot, Saussinet, Sirolle, Trompe-Gourmand, &c. The Drying Pear occupies a prominent position amongst the economic productions of Switzerland and Germany. The Kannenbirne, or Etranguillon, is much cultivated there. The slices of dried Pears, called séchons, are used for stewing and for perry. The orchard Pear tree, bearing fruit intended either for dessert, for cooking, or making perry, should be grafted on a seedling, and trained as a standard. It is grafted at the collar, or higher up, either where it is to stand or in the nursery. The tree is left to itself, after having trained the branches for the first year or two. Later on, it will only be necessary to clear the thick branches by annually cutting in those that are etiolated, or incapable of bearing fruit. By this, a more regular fructification is secured, and the vigour of the tree is preserved.

The Apple Tree.

This thrives in alluvial sand, where soil is mixed with silicious clay, and upon soils resting on a granite bed, as well as in those where the turfy humus neutralises the aridity of the limestone. Moderate coolness and a sub-soil sufficiently porous and permeable is favourable to it. The fruit is generally larger in damp valleys than in exposed situations; but has a finer flavour when the trees are grown upon hill-sides, and on flat ground that is not liable to saturation. An excess of moisture, as much as a want of air, engenders canker and grub. An excess of dryness will cause the tree to wither. Land adapted for Wheat in general suits the growth of the Apple. It thrives admirably on the mountains of Auvergne, in the meadows of Normandy, Brittany, and Picardy, and in Flanders, Germany, Sweden, and Russia. The best should be selected for dessert; those of a less superior character for cooking; and those of inferior quality for making cider.

Summer Apples.—Red Astrachan, Rose de Bohême, Borovitsky, Transparente de Cronsels, and Rambour d'Eté.

Autumn Apples.—Gravenstein, Reinette Burchardt, Reinette Grise d'Automne, Belle Fleur, Reine des Reinettes, and Royale d'Angleterre.

Winter Apples.—Doux D'Argent, Belle Fleur Jaune, Parker's Grey Pippin, Reinette d'Anthézieux, Pigeon, Reinette de Cuzy, Reinette du Canada, Reinette Grise, Reinette Dorée, Fenouillet, Reinette Franche, Calville Blanc, Api Rose, Reinette des Carnes,

Renette de Caux, Azeroly Anisé, Reinette Baumann, Reinette Tardive, Clarke's Pearmain, and Jacquin.

Late Apples.—Care should be exercised in selecting late fruiting Apples. In cold countries they escape the inclemency of spring; but, in a warm locality, they have to run the risk of their blossoms being scorched. Of late-fruited varieties there are many. In general, their fruit is hard, acidulated, and chiefly adapted for household use. The following are good, both for dessert and for cooking, and, when needed, they can be used for making cider—viz., Belle des Buits, Bonne de Mai, Courpendu, Cusset, De Jaune, Jean Huré, Locard, Pépin d'Or, Reinette à la Longue Queue, Reinette Clochard, and Saint Bazan.

Cider Apples.—Let us direct attention to the manner of choosing cider varieties. Whenever an Apple, on being pressed, is found to be juicy, it is usually considered to be fit for cider. In the opinion of *connoisseurs*, however, cider is never perfect except it is limpid and clear, of an amber colour, piquant and agreeable in taste, and without any unpleasant odour or acidity. Practical cultivators know that, in order to obtain cider of this description, it is necessary to mix acid, sweet, and bitter Apples together, in the proportion of one part of the first to two of each of the latter kinds. This proportion is based upon the fact that Apples that are acid or sour give an abundance of juice, those that are sweet impart an agreeable flavour, and those that are bitter tend to preserve it. Cider made from either kind separately has its inherent faults. If made from the first-mentioned, it is indifferent in quality, and becomes dark when out of the cask; if from the second, it is of a pale colour, and will not keep; and, if from the third, it is produced in sparse quantities, and is too thick. Mixed, however, an abundance of juice is obtained, which has a pleasant taste, and keeps well. This combination need not be rigorously adhered to; sometimes it is only necessary to make use of sweet and bitter Apples, and the beverage is sufficiently charged with sugar and tannin. The character of the soil and climate may modify this prescription; analysis shows that the quality of the cider thus blended depends upon the just proportion of sugar, mucilage, and malic acids. Science also shows that green fruit contains about six parts of sugar, ripe fruit twelve, and mellow fruit only eight; thus, it will be seen that sound ripe fruit only must be made use of. Often enough this proportion spoken of is settled at the time that the trees are planted. Thus, in Normandy, they plant five Gagnevin Apple trees for one of the Coquet variety, one of Gros Bois, and the mixed crop is sent to the press together. These divisions of sweet, acid, and bitter Apples may be arranged according to the period at which the fruit ripens. Cider Apples are grouped into three seasons—September, October, and November; in each season are found sweet, acid, or bitter fruit; and the crop is combined so as to send to the press varieties differing in flavour, but at the same stage of ripeness. The Apples of the first season, amongst others, are Ambrette, Bonne-Ente, Camoise (acid); Doux-à-l'Aiguel, Rouge-Bruyère, Frangée (sweet); Amer-Doux, Blanc-Mollet, Friquet (bitter). These produce a cider that contains sufficient sugar; and, although decidedly acid, pleasant to the taste. It bears the admixture of but little water, and should be drunk within the year. The Apples of the second season, amongst others De Rennes, Courte Queue, Fleur d'Auge (acid); Gros-Doux, De Rouget, Doux-Evêque (sweet); Cul-Noué, Amer-Rouge, Petit-Ameret (bitter); furnish a good mellow cider, which is in much demand for bottling. The Apples of the third season, amongst others, Glane d'Oignon, Long-Bois, Surette (acid); Marin-Anfray, Rousse, Peau-de-Vache (sweet); Bec-d'âne, De Monnier, Gros-Amer (bitter); are very valuable for making coarse cider. Less delicate than the preceding, the beverage may be kept several years. These remarks may be said to apply to all countries, without taking into consideration existing diversities. For the cultivation of the Apple tree as a commercial speculation, standards upon wild stocks should alone be used. The tree is grafted where it is to stand, or subjected to preliminary training in the nursery. By leaving the branches to take their own direction, the tree assumes a natural development, and it will be sufficient to equalise the strength of the branches when young, and every year to prune or cut back those that are worn out, or are growing confusedly, without causing any wounds that are too severe. Should grubs give trouble, it will be necessary to loosen the earth round the trunk, and pour in lime-water. I have not as yet referred to show Apples. The most beautiful are Amélie, Joséphine, Grand Alexandre, Belle-Dubois, Ménagère. These should be cultivated in clumps, or in a cordon upon a Doucin or Paradise stock. It is possible to make arbours with them, or they may be used in many other ways.

The Plum Tree.

This is one of the least exacting of fruit trees as regards the quality of the soil in which it is planted. Most lands that are fit for cultivation will suit it, provided always that they be not too clayey

nor too damp. It, however, prefers a somewhat mellow soil, with a permeable sub-soil. Its flowers suffer sometimes from late spring frosts, but its cultivation, nevertheless, extends very far north. Immense orchards of Plum trees exist in Europe and in America, and even Africa and Asia are not without them. In Roumania Plum cultivation gives rise to a special industry—that of manufacturing Plum brandy. In Hesse, as statistics show, there are three million Plum trees growing—a number double that of the Apple trees—and these, for the most part, are cultivated by the roadside and in public places. In France, in the Agenais, proprietors obtain for their crops of Plums D'Ente or D'Agen as much as £400. One single firm of Cassaneuil does business to the extent of £160,000 exclusively in Prunes. La Lot et Garonne produced, in 1872, 25,000,000 of Prunes. The Bordeaux markets disposed of £600,000 worth, half being exported. The Sainte Catherine of Touraine, the Mirabelles, and the Quetches of Lorraine, are equally valuable as a means of enriching those who undertake their cultivation. The Reine Claude and Mirabelle, which may be called the common Plum, yield in La Marne and La Meuse fabulous returns. Thus, in 1872, whilst Vitry-le-Brûlé sold £4,000 of Reine Claude, and Sainte Menehould £3,200 worth, the neighbourhood of Sainte Mihiel sent 800 waggon loads to Lerouville. Nor must it be forgot that the Department of L'Aube, the Commune of Baroville, has become rich through its Plum trees, its Grapes, and its Gooseberries, and sells Reine Claudes to the value of £2,000 annually. At the present time the neighbouring villages are imitating the example thus set with success. Like the Apple, the seed of the Plum tree often produces good seedlings, but the most certain mode of propagation is the grafting of good kinds upon healthy and robust seedlings, not upon suckers.

Early Plums.—Favorite Hâtive, Mirabelle Précoce, Jaune Hâtive, Précoce de Tours, des Béjonnières.

Mid-season Plums.—Monsieur Hâtif, Monsieur Jaune, de Kirke, Reine Claude, Mirabelle.

Late Plums.—Reine Claude Violette, Tardive Musquée, Madam Nicolle, Coe's Golden Drop, Mirabelle Tardive.

Prune-Plums.—D'Agen, Sainte Catherine, Quetche, Datte, Jaune Tardive, Perdrigon, Damas, de Norbert.

The Plum tree, when once well-formed, does not require pruning, except so far as the cutting back of branches that are unhealthy is concerned.

General Directions.

Distance Apart and Preparation of the Soil.—The mean distance of standard fruit trees of any kind is calculated according to the probable development of the branches. Thus, from 20 to 32 feet is suitable for Pear and Apple trees; these distances are increased where the soil is unusually good, or in a mixed orchard, in which the trees are planted in masses and not in single lines. The distance between the trees should also be increased if small subjects, such as half-standards, pyramids, or bushes, occupy the intermediate spaces. For a plantation of trees at a short distance apart the soil should be trenched; but, for full-grown trees, the subjects being at greater distances, it will be sufficient to open large holes 3 feet 6 inches wide, and 2 feet 6 inches deep at the least. The more roots the larger of course should be the holes. They should be opened with a spade and the bottom and sides broken up, in order that the roots may not be surrounded by hard soil. Where the sub-soil is inferior in quality take it out; but, if from its depth or nature, this presents difficulties it is better to leave it, and to enrich the top-soil with a layer of some better kind of compost. The best materials for this purpose are vegetable and alluvial soils, turf, the detritus of rivers, leaf mould, sweepings of streets, marl, and similar substances mixed together, until a compost thoroughly favourable to tree life is obtained, for the object of manuring is to supply to the soil that of which it is deficient. These ingredients, mixed with well-rotted dung, is incorporated with soil at least a month before it is wanted for use. Leaving the holes open, too, for some time previous to planting, contributes to the amelioration of the soil through atmospheric action. Where the soil is too wet, it should be drained; and even broken stones placed at the bottom of the holes, and covered with sods, with the grassy sides down, will be of benefit to the roots, and not interfere with the regular drains. Where the soil is naturally good, and of a sufficient depth, manure is unnecessary.

Planting and Pruning.—Planting is best done when the trees are at rest, that is, between the fall of the leaf and the depth of winter. The drier the ground is the later planting may take place. The trees having been removed with care from the nursery, should be examined before being planted. If their roots have suffered from exposure they should be soaked in a mixture of clay, water, and cow-dung, and before finally placing the tree in the ground all mutilated or denuded roots, as well as exhausted rootlets, should be cut

off, and, at the same time, the most vigorous of the branches should be cut back, while such as are useless or badly placed should be cut off altogether. Lightly press the soil after planting, especially if light and porous; stake the tree and water the ground. Plant in clumps or in lines according to the taste of the cultivator. Some annual or biennial cutting-back of the branches will be necessary, at least for a time, in order to properly balance the tree and ensure its fructification. A mulching of dung, Fern, Moss, tan, or similar substances, should be spread over the roots early in spring to prevent evaporation. In warm situations the stems of the trees should also be painted with a mixture of mud, dung, and lime. During the first few years the ground over the roots should be kept clear of Grass and weeds, and every autumn the mulching of dung should be forked into it. In spring a fresh mulching should be put on. When the trees have arrived at maturity this may be dispensed with, and laying the orchard wholly down in Grass will do no harm; if, however, it is thought fit to cultivate it, deep digging should be avoided. The bark of the trees, both of stem and branches, should be scraped where insects are likely to harbour, and Moss, Lichen, Mistletoe, and dead wood should also be removed. Where the trees in an orchard need renovating through being somewhat worn out, the earth round their roots should be renewed. The old bark should be cleaned, and the principal branches cut back to a certain distance from the trunk. The Apple, Pear, Apricot, and even the Plum, may thus be operated on. Instead of cutting the branches removed back close to the trunk, it is preferable not to cut nearer than a foot or eighteen inches of it. The stronger the tree the more should the branches be thus cut in. Rub the wounds over with a mixture of cow-dung and clay. If the variety thus operated on be unsatisfactory, it may be changed by grafting upon it a more valuable kind; in this case crown grafting is best, and the more limbs operated on the better. When the grafts shall have begun to grow freely they should be supported, in order to prevent their being blown off. Where the tree is too old or too defective to be of any use it should be felled, the roots extracted, and before planting another tree in the same place the soil should be renewed.

Fruit Gathering and Storing.

For these operations fine weather is indispensable, and the fruit should be plucked neither too green nor too ripe. Gathered in this state, it gains in quality by being kept, and bears carriage better than when too ripe. In gathering fruit, care must be taken not to injure the branches, or to break the fruit-bearing twigs; with the exception of fruits for cider, Nuts, Chestnuts, Almonds, that are brought to the ground by shaking with poles—a violent proceeding, it will be admitted—the other kinds should be gathered by hand. For this purpose, double or single ladders and hooked switches, to draw the branches, should be used. An instrument, called a fruit-gatherer, is also sometimes employed, by which fruit at the extremities of branches, or inaccessible, is seized. The fruit, when gathered, should be laid gently in a basket covered with foliage, and taken to an airy fruit-room, where they should be placed upon a bed of Rye-straw; soft-fleshed fruits, such as Apricots, Cherries, Peaches, or Plums, may remain in the baskets or upon boards. For this kind of fruit, a moderate temperature in the fruit room is indispensable. Too great a heat will precipitate their ripening, whilst a cold atmosphere will disturb the elaboration of their juice. The dryness of the fruit-room is also a necessary condition; and the removal of diseased or spoilt fruit must never be forgotten. The Apricot should be gathered, when the skin, without being faded, assumes a duller shade; the green part becomes yellow and marbled. The Apricots intended for carriage should be gathered during cloudy weather, before the flesh has lost its firmness. Those used for marmalades, and for similar purposes, should be riper than would otherwise be necessary. If the crop of a tree be gathered all at once, it will be easy to divide the fruit for immediate consumption from that which is intended for carriage. The Cherry should be gathered when fully ripe, and before its colour is tarnished; Griottes may be gathered later, with the exception of those intended for making ratafee; Whitehearts and Guignes will decay if they are not gathered before their skin becomes too highly coloured. The Peach is fit for gathering when its green side gets bright, and the perfume very perceptible. Summer Pears should be gathered as soon as they commence to turn yellow, or to fall. Autumn Pears may be taken from the tree when they can be removed without using much force; they should then be placed in a room in which there is a medium temperature. Winter Pears may be plucked later, but in all cases before white frosts set in. The fruit-room in which they are placed should be kept dark, regular in temperature, and not exposed to damp or frosts. It should be furnished with drawers, one above the other, and with open shelves made of laths. Early Apples require gathering when they are ripe; winter kinds

should be gathered at the end of the season; if allowed to remain upon the tree tender Apples ripen more rapidly; keeping Apples, on the contrary, are improved by being allowed to hang late, that is, if they are gathered before the fall of the leaf. Cider Apples are gathered in the simplest manner; the tree is merely shaken, either by hand or by means of crooked poles, and there is no danger in having them out-of-doors until they are required for pressing. The ripeness of Plums may be known by the strong perfume which they emit, and by the fall of the fruits when the trees are slightly shaken. They should be gathered with care, and those that are injured should be separated from the rest. Choice Plums should be gathered by hand, care being taken not to injure the skin, for a Plum deprived of its bloom loses much of its value.

Packing Fruit.

Fruits should never be gathered during rain, fog, or whilst dew is on them, nor during great heat, and the longer their journey is likely to be the more rigorously should these instructions be carried out. It should not be forgotten that fruits in a close-confined place go on ripening, and in consequence it would be imprudent to introduce any that are in a state of decay, or likely to become spoilt in transit, and precautions should be taken against the introduction into the packing-cases or baskets of substances likely to aid fermentation, such as damp hay, fresh Moss, or green leaves. All fruit that is damp should be wiped dry in the shade before being packed. In conclusion it is desirable with all kinds of fruit—1st, to use moderate-sized baskets or packing-cases (ten of a small size are better than one of large dimensions), and to avoid too great a number of layers of fruit one above the other. 2nd, to fill up the spaces between the fruit with pieces of paper, Grass, Oat-straw, bran, sifted sawdust, or wadding. 3rd, to pad the bottom and top with Rye-straw, with thick paper, or dry Fern leaves. 4th, to close the lid so that it may press lightly but firmly upon the fruit, and thus prevent its being shaken about inside. Choice or delicate fruit should be wrapped in a sheet of paper, silk-paper being used for tender-skinned varieties and ranged in layers in small wooden cases. If many layers are necessary, the toughest specimens should be placed at the bottom.

Keeping Apples Out of Doors.—The "Rural Home" gives an account of an experiment near Rochester in keeping Apples on the ground under leaves. Two bushels of leaves were placed on one bushel of Apples, the whole being partly surrounded by evergreen trees, which kept the wind from blowing the leaves. They were found this spring less decayed than Apples in the cellar, and fresh and fine in condition. There were obviously two or three causes which made them keep well. Contact with the earth gave them moderate and uniform heat from below; the leaves, being stratified, turned off the water and kept out the cold, the frost of very few winters ever reaching through a foot of leaves; and the evergreen trees gave additional protection. If we were covering Apples in this way in an exposed situation, we should want a foot of leaves, held down by evergreen branches; but, surrounded closely by evergreen trees, half that depth of leaves would answer.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Strawberries at Christmas.—I am just now busy potting Keen's Seedling Strawberry plants, forced ones, or what have fruited, into 16-sized pots, in order to try to get them to produce ripe fruit at Christmas. Shall I succeed?—R. GILBERT, *Burghley*.

Watering Strawberries: L. W. B.—It is very desirable that Strawberries should be well watered. Begin watering just after the flowering is at its best, and continue it while the fruits are swelling.—B.

Peach Trees Dropping their Fruit.—What is the reason my Peach trees have lost all their fruit, except a few at the extreme ends of the top branches which have lost their foliage? The trees are good and healthy-looking, and produced a good crop last year for the first time. Can any of your correspondents kindly assign a cause for this mishap?—A. K.

Duke of Buccleuch Grape.—I have often been disappointed in growing new Grapes, but I am happy to tell your readers that this is a splendid variety. I have at this time (May 8th) a Vine of it growing in a 10-inch pot, bearing six clusters of such white Grapes as are seldom seen. The berries are clean (except a single one), of enormous size, of a fine amber colour, and have an exquisite flavour. If Mr. W. Thomson had produced nothing besides this superb Grape, it would have been sufficient to have established his reputation.—R. GILBERT, *Burghley*.

The Phylloxera and the Means of Staying its Ravages.—This has for some time occupied the thoughts of Prof. Dumas, who, after much labour and research, has hit upon an agent which, while being fatal to its insect parasite, is said to be beneficial to the Vine itself. The agent employed by M. Dumas is sulphuric carbonate of potash. The mode of application is in the form of a light dressing over the surface of the soil of Vine border or vineyard, where the salt is soon dissolved by rain or artificial watering, and the solution carried down to the roots, where it destroys the insect, which, the moment it is touched by it, is done for, while both roots and Vine are rather benefited than harmed.

THE INDOOR GARDEN.

CULTURE OF SPECIMEN PELARGONIUMS.

FEW of those who admire splendid specimen plants of Pelargoniums, exhibited at this season of the year, have any idea how rapidly such specimens are got up under good culture, or that only a year before, perhaps, they were but cuttings, or one-year-old plants. Pelargonium growers like to have symmetrical specimens, though they may not be meant for exhibition, but only for the conservatory or perhaps the vases in the house, where they can be seen and admired. It was my duty, at one time, to get up such plants for a noted exhibition, and also for decorative purposes on an extensive scale, and I always adopted the following method:—The cuttings may be put in any time between spring and autumn, but the best time is just after the plants have finished flowering, when the wood is somewhat hard and ripe, which is generally late in June or July, or even as late as August, but the sooner the better; and those who purpose taking cuttings off their old plants should stand them out of doors after flowering, in order, in some measure, to harden the wood. Stout, short-jointed cuttings, about 3 inches long, should be selected. Side shoots that have not formed are best; but, if these cannot be obtained, any of the limbs will do, cutting them about three or four joints in length. These must be cut close below the bottom joint, and inserted singly in 3-inch pots, in a compost of sifted loam, leaf mould, and sand, in equal parts; and afterwards watered and plunged in a frame where there is a slight bottom-heat of 70°; or they will strike, but not so soon, nor so certainly, on the shelf of an intermediate house. Cuttings of what are called "fancy varieties," however, require frame treatment and bottom-heat. When the cuttings are rooted fairly, which will be in about three weeks, they should be lifted out of the bottom-heat, and set on the surface of the bed to harden them a little before removing them to a greenhouse or cold house, for an airy, dry, greenhouse temperature suits the Pelargonium best, and the less fire heat it is subjected to the better; in winter good growers never allow the thermometer to rise above 45° with a dry atmosphere and free ventilation. After the cuttings are fairly hardened off they may be shifted into 4½ or 5-inch pots, first crocking the pots carefully to the depth of about an inch. For this shift the best compost is turfy hazel loam, chopped up as finely as possible with a spade, and to which has been added one quarter of silver sand and charcoal dust and a little well-rotted cow dung or much-decayed hotbed manure free from worms. In shifting turn the plants carefully out of the pots, remove a little only of the surface soil, the crocks at the bottom, and disentangle the roots when they are matted; pot no deeper than before, and fill round with the compost without pressing it very hard; leave half-an-inch for watering, and restore them to their former airy and light quarters, watering them thoroughly, especially if the pots be new. Partial shutting up and dewing with the syringe may be practised on bright days; but in dull warm weather it will not be necessary. The plants will now be growing apace, and the shoots should be pinched and pegged out in opposite directions, but not too flat. This will cause them to break afresh at several places, and the young shoots thus produced must be allowed to grow 3 or 4 inches and again stopped, but without pegging, merely pressing the shoots down and outward with the hand now and then to broaden the head and admit the light until the plants are ready for another shift. The disposition of the branches to break thickly depends upon the light and air they receive as much as pinching, for the Pelargonium is disposed to assume a branching habit naturally. About midwinter, or a little later, the plants will be ready for their final shift into 8 or 9-inch pots, according to their vigour and progress. The same compost as before should be used; the same care exercised in potting, and afterwards the outside shoots should all be pegged down to the surface of the pot. When this is done the plants will, in some cases, be 12 or 18 inches across. The shoots in the centre should also be stopped and pegged outward at the same time. This forms the basis of the future specimen plant. The plants will be green, and keep growing slowly all winter, with a minimum temperature of 45°, and a slight rise during the day in fine weather, admitting a free circulation of air, avoiding draughts, and applying fire-

heat only to sustain the nursery temperature and expel damp. After the last shift, but little pinching will be required, if the plants have been struck early, and are required to bloom in May and June. The broad bottom formed by pegging out the shoots in winter will throw many shoots, and these will make a regular growth, greatly increasing the diameter of the plant. As the season advances, gentle smokings must be given to check greenfly, and syringings in fine afternoons. When the flowering shoots lengthen, the plants should be staked or tied. To give breadth and size, the bottom shoots should be tied down to stakes inserted in the pot, projecting outwardly, and as low as the rim of the pot will permit. The next tier of shoots may be staked out in the same way, or tied down to the others with fine matting, and the next tied to these again, and so on, till the shoots are evenly distributed, and the desired circumference and symmetry are attained; but all training should cease before the plants come into flower. Pelargoniums should at all times have enough water. In winter, very little is required to keep the soil in a moist state, and cloggy wetness must be avoided; but, as the days get longer and drier, the supply must be copious, and not given in dribbles, but in sufficient quantity to soak the ball of the plants thoroughly, until the water runs out at the bottom of the pots, and, just before the flower-buds begin to form, weak liquid manure may be given two or three times a week, and continued till the flowering is over. After this, the plants should be turned out of doors till August, when they should be cut down. **CHEF.**

HAYES'S CINERARIAS.

AMONG the many plant-growing nurseries round London, few are more interesting than that of the Messrs. Hayes, at Edmonton, and



Large Crimson and White Cineraria (Hayes's).

they are particularly notable for a very good strain of Cinerarias. Messrs. Hayes lately sent us a collection of blossoms. Some of these were so remarkable for size, as well as for rich beauty of colour, that we have engraved one of them, exactly life-size. It is scarcely necessary to add that the central and earlier blooms are always much larger than the blooms that come afterwards; but, even bearing in mind the fact that the blossom figured for *THE GARDEN* was one of these early blooms, its size is none the less remarkable.

THE MANGOSTEEN.

MUCH has been written lately in depreciation of tropical fruits. The Apples, Pears, Grapes, Peaches, Plums, and Nectarines of Europe—its delicious Strawberry, and even the pungent flavour of our Gooseberries and Currants, have been exalted, and perhaps with good reason, as delicious realities, while the laudatory descriptions of inter-tropical fruits by Eastern poets have been treated as the airy fabrics of vivid imaginations, and as having no actual foundation in fact. West

India Pine-apples have been pronounced tough and tasteless compared with a Pine grown in England or France; Dates are now deemed insipid; the large, ponderous, handsome-looking Shaddock is found to be but a base-born giant of the Orange tribe, the purest blood of which is found in the delicate little St. Michael's that flourishes in the Azores. There is one, however, among the tropical fruits, which all who have tasted, in the sultry clime of which it is a native, pronounce to be the most exquisite of all fruits, viz., the Mangosteen. Its creamy rose-tinted pulp and juice are said to possess a bright, delicate, and at the same time rich flavour that is not approached by that of the ripest and finest Nectarine; resembling, as it does, a combination of the Grape and Strawberry, but surpassing both. This rich, creamy pulp is contained in segments similar to those of an Orange; but the rind, or rather husk, is more solid and harder, somewhat similar to that of a Pomegranate. It is a native of the Moluccas, but has been introduced into Java by the Dutch, where it thrives in great luxuriance; and has been sung of by Dutch poets, in ponderous but passionate verse. It has also been introduced to the Malacca coast, where it appears to thrive equally well. I have just been conversing with a gentleman recently returned from Prince of Wales's Island, otherwise Penang, on that coast, who speaks with an enthusiasm akin to ecstasy of its delicious qualities. Dr. Solander, who, as the companion of Sir Joseph Banks, accompanied Captain Cook in his first voyage round the world, speaks of the grateful coolness and exquisite flavour of this fruit; and ascribes his recovery from the last stage of a putrid fever to continually sucking its juice, to allay his burning thirst. It is the only fruit of which, in tropical climates, the sick are allowed to partake without scruple; and its soothing qualities are much valued as a luxury in the sick room, at once delicious and healthful. The tree is of remarkable and handsome growth, with branches issuing at right angles from the main trunk, like those of a Fir, but, instead of Pine-like foliage, having fine shining leaves of an oval form, 7 or 8 inches long. The horizontally-spreading branches are mostly at the top, so that it forms a kind of picturesque umbrella of beautiful foliage, and is so handsome a tree when its flowers, like single Roses, or its fruits, with their rich brown husks, about the size of an Orange, are in perfection, that the Dutch colonists of Batavia look upon it as the most elegant of trees for adorning a garden, and affording an abundant shade. Its name, *Garcinia Mangostana*, embodies that of its first scientific describer, Dr. Garcin, a distinguished eastern traveller, and its native name, Mangostans. It is said that the plant, which was introduced here in 1759, rarely survives its importation to this climate for any length of time; but this must surely be from the nature of its constitution and requirements not being sufficiently understood. It has both bloomed and fruited once in this country—and why not again? In the tropical house at Sion, the late Duke of Northumberland had the gratification of seeing a specimen of this beautiful tree flourish with such healthy luxuriance that it both flowered and ripened its fruit; and the fruit then produced was deemed worthy of being sent to her Majesty for the royal table. Success having been achieved so far, even if the fruit then grown were not produced in full perfection, it has been shown by that partially successful effort that the placing of a fresh Mangosteen upon our English dinner tables is not beyond the range of the present improved state of our horticultural knowledge.

H. N. H.

CLEAN v. DIRTY POTS.

THERE are not a few articles in the gardener's creed which are matters of faith more than experience—maxims that have been handed down to and adopted by us without questioning. In our own time some of these have been confounded, and others totally refuted, by more careful experiment and observation. Among other fallacies of this character is the belief that plants do not thrive so well in a dirty pot as a clean one. By a dirty pot I mean one that a plant has been in before, and which is used again without being washed. I quite expect that this statement will be received with horror as perfect heresy by fastidious gardeners. I repeat, however, that an unwashed pot—in which, of course, there has previously been nothing deleterious to plants—is just as safe and suitable to a plant that has not again to be shifted as one that is perfectly clean; and I make this reservation because I am aware that plants do not turn out well from a dirty pot when they have to be shifted. In other respects, neither a dirty inside, nor a dirty outside, do any harm. In other words, it is a matter of no consequence whether a Pine plant, or a pot Vine, for instance, is finally shifted into a dirty pot or a clean one. I do not wish to dissuade anyone from washing their pots who may be disposed to do so, lest I should be found encouraging untidy habits, and for this reason part of our wet-day work is still pot-washing; but we never wait to wash the inside, at least of our pots for fruiting

Vines, Pines, or other plants, if they are not ready to hand, unless they are so dirty as to interfere with the drainage or the holding capacities of the pot, and then they are only rubbed with a wisp of matting. Another reason is, that we have no time for needless work; and if every pot that we used had to be washed the loss of time would be considerable. Of course I am prepared to furnish a reason for holding this opinion, and I am still open to conviction, if any of your readers can satisfy me that I am wrong theoretically or practically. In the first place, then, one of the chief objections urged against dirty pots is that the dirt chokes up the pores of the earthenware; and this, it is assumed, interferes with the well-being of the roots. It is astonishing how many people still adhere to this belief, simply because they have never given the subject a thought, or at least have never tried any experiments which might lead them to a correct conclusion; and so they go on washing prodigious quantities of pots every year down to the thumb-pots that hold their most indifferent bedding plants, and look upon the work as of paramount importance. It has been shown, however, that the porous theory is not a theory at all, but only an hypothesis, and a wrong one; for plants thrive just as well in pots that are glazed, or made of slate, glass, or any impervious material, as in the most porous earthenware; "experience," as Dr. Lindley says, "has settled this question." As this is the only tangible objection I have ever heard raised, I have no more to answer. What little actual dirt adheres to a pot when a plant is turned out of it becomes part and parcel of the soil with which the pot is filled, and is in no way injurious to the roots; and if anyone tries, they will find a dirty pot just as well filled with roots as a clean one. I have not experimented with all kinds of plants as yet; but I have with pot Vines, Pines, Ferns, and many kind of stove and greenhouse plants; and I might defy anyone to tell the difference between the plants in the dirty pots and those in the clean ones grown side by side. Our fruiting Queens Pines last year were transferred to pots, when shifted finally, from which Pines had just been turned out; they were only wisped, but, notwithstanding this, the fruit was just as good as formerly. In fact, the heaviest Queen we ever grew was cut last year, and weighed within a fraction of 6 lb. All our bedding-stock, except those which go into the additional new pots we get every year, is potted in unwashed pots. Those in the dirty pots thrive quite as well as their neighbours in the new ones; and as the plants are generally rather pot-bound when planted, they turn out of the pots well enough. It will be seen, therefore, that I am not advancing a merely speculative opinion, but facts that I have proved, to my own satisfaction at least. If, therefore, we could only dispense with washing the pots outside on the score of tidiness, we should be relieved of a serious item of annual labour and expense.—"The Gardener."

Tropæolum tricolorum Grown as it Should be.—A few plants of this, nearly 4 feet high and 3 feet through when in flower, always attract attention. When such plants have done blooming they should be removed to a reserve house, where they should be allowed to gradually dry off. When they have completely died down, the pots should be laid for a time on their sides under the stage. In autumn they should be again re-potted, though sometimes they do well without such attention. Loam, with a small proportion of peat and sand, makes a suitable compost for this plant, the bulbs of which should be set about 2 inches under the surface. When the young shoots begin to grow, care should be taken to well cover the base of the trellis with them. The top of a well-furnished Spruce Fir makes a good support for this plant, provided it has been some time cut; a balloon-shaped trellis is, however, generally used.—R. M.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Carnation Blooms in January.—I want Carnation flowers in quantity next January. My plants are strong, just potted into 32-sized pots. Should they be stopped at the points? They are about 7 inches long, and growing in a cold house.—FITZROY.

Propagation of Mesembryanthemum cordifolium variegatum.—I experienced some difficulty in propagating this until I found that it would not stand what is termed "coddling." At first I used to put the pots of cuttings of it in a close frame in the propagating-house; but they so uniformly damped off that I had to try other means; so, on the principle on which other watery-stemmed plants are struck, I set the pots of cuttings full in the sun on a shelf in the same house, and now they strike root as fast as possible.—N. H. P.

Sowing Hardy Primula Seed.—I have recently had an excellent illustration of the uncertain character of the germination of hardy Primula seed. Last year I saved seeds of *Primula cortusoides* *amœna* *lilacina* and sowed them in a pot about the month of August. Of this two seeds only germinated in the autumn, and of these one died before the end of the year. For the sake of the remaining plant I kept the pot all through the winter, and, to my surprise, I found that other seedlings came up about the middle of March; more followed, and now I have some fifty seedlings, all good strong plants, as good as the one that grew in the autumn. I have no doubt that had I kept the seeds until the spring before sowing them they would then have germinated at once.—A. D.

THE KITCHEN GARDEN.

KIDNEY BEANS IN SMALL GARDENS.

THERE is no room for dispute as to the propriety of growing Kidney Beans in small gardens. In the whole of the list of useful vegetables, there is nothing so suitable or so profitable to be found; nothing so easy to manage, nothing that so thoroughly suits all tastes and all occasions. If room could be found for only one vegetable in a garden, the choice should certainly fall upon some kind of Kidney Bean, as affording a maximum of profit with a minimum of risk, and in some cases serving for ornament as well as use. It is well for the owner of a small garden to bear in mind that, although Kidney Beans will grow in any good soil, they grow all the better if the ground is deeply dug and well manured. The truth must be told, that in small gardens Kidney Beans are generally very badly managed. They are put on poor ground, the rows too close together, and the plants too thick in the row; and yet with such bad management they pay—but they pay much better when treated with a little skill. Let the ground be well dug, and unless it is in good heart dig in a liberal dressing of rich manure. For this, as for every other crop, the land ought to be made ready some time before it is wanted, but between what "ought" to be done and what "can" be done there is often a wide difference. The proper soil for the whole tribe of Kidney Beans is a light but substantial loam of considerable depth. In hot, dry, shallow soils the plant may be attacked by red spider, and on cold lumpy clay a wet season will probably kill it. The small gardener can do what the large gardener may find impossible: he can give water to his rows of Kidney Beans, and thus help them amazingly, if the soil is thin and poor, or the summer unusually dry. Kidney Beans are of many kinds. About fifty varieties have been grown here, and there were not half-a-dozen bad ones found. Some are very dwarf and bushy, others show a tendency to run, and will rise 2, 3, or 4 feet high, and others again are true runners, and will rise 6 to 10 feet if in a good soil and properly supported. A considerable number of sorts are quite unfit for a small garden. All the very dwarf and very early kinds that are preferred for forcing are of no use at all to the small gardener. Of the dwarf kinds none are better than Chinese Early, Mohawk, and Negro. These are extremely fruitful and of excellent quality. They provide us with what are termed French Beans. To grow these well they should be sown in drills 2 inches deep and 2½ to 3 feet apart. If there is a want of room and the soil is poor, you may put the rows at 3 feet apart. In our strong soil, 3 feet is the least distance allowable, for the plants spread so that there is only just room left to get amongst them to gather the crop. The great waste of seed in small gardens is a matter to be regretted, for the experience of one season ought to be enough to tell anybody that robust growing sorts, such as have been named above, require to be at least a foot apart in the row, and I have seen them meet at 18 inches. It is a good rule to sow fresh seed 6 inches apart, and afterwards thin to double that distance. But if thin seeding is dreaded, put them singly 4 inches apart, and when fairly up pull out every other one, and with the waste mend any blanks that occur. Having got thus far we have but to keep down weeds, and a plentiful supply of the very best French Beans may be anticipated. In sowing Runner Beans, the same rules should be followed, but a greater distance must be allowed between the rows. Here comes the question, are they to be staked? Now, on that question, I wish to speak decisively. I say that in small gardens they must be staked, and with good strong Hornbeam or Alder stakes, or something as good of home production. The distance between the rows, if they are to be staked, should not be less than 5 feet, and the rows should run north and south, that the sun may shine on every plant with the utmost equality possible. If it is impossible to have rows north and south, more space between must be allowed, and to prevent waste of ground the rows should be 7 feet apart; make a trench for celery between every two rows or put in Winter Greens or sow Lettuces, the main point being to secure for the Runners abundance of light and air. The stakes having been prepared should be driven in rows that must not be too close together, which is often the case, ten times as many plants as there ought to be being crowded into the rows. The best of all the Runner Beans is the old common Scarlet. If no other kind is grown, much will not be lost. The White Dutch is a fine sort, producing plenty of large tender pods; and the Painted Lady, though scarcely first-rate, is admissible for a change, as its flowers are white and scarlet, thus combining the floral characters of the Scarlet and the Dutch. In early districts Kidney Beans may be sown in the middle of April; but, as a rule, it is not safe to sow until the first week of May. One sowing is not enough for any garden. French Beans and Runners are wanted as soon as possible, generally speaking, and a row or two of Chinese Early should be sown as early in April as the average climate of the district will

permit, and sowings of Runners and Negroes should be made in the first or second week of May. Now it is of considerable importance that Kidney Beans should be sown about the middle of June to provide a succession. It is usual for the earliest-sown crops to be quite worn out long before the season is over; but a sowing made from the 10th to the 20th of June will provide supplies of tender Beans until the frost makes an end of all such plants. We have had Runners sown on the 10th of June, close under a fence looking south, bearing abundantly nearly until Christmas, in seasons when the autumnal frosts were brief and gentle. In any case, a row or two sown in the middle of June will pay so well that, whoever adopts the practice once, will continue it. As to gathering the crop, the most profitable way is to gather all, taking the Beans as fast as they acquire a proper size, and not allowing one to become stringy. Even if it is found necessary to give away a quantity, it is best to gather all that can be got as fast as they come; but, if it is considered desirable to save some of the seed, a row, or part of a row cannot be left untouched. If it is gathered from plants that it is proposed to take seed from, the quality of the seed is spoilt. If seed is wanted, trust to plants that have not been gathered from at all; and, as to the rest, gather every pod that can be got.—“Gardeners’ Magazine.”

The Sugar Pea.—I would direct the attention of my fellow-cultivators to the excellent Pea, known in France as the Mangetout, and in Italy as the Wrinkled Pea, in allusion to its corrugated aspect when dried. The peculiarity of the Sugar Pea, as this variety is called in England, is, that the entire pod, if strung like a French Bean, is quite tender and eatable. It is, therefore, much better adapted to the limited space of a cottager’s garden than those varieties, of which more than half must go to the dust heap. The pod, when fit for eating, is of a large size, some times $3\frac{1}{2}$ or 4 inches long, by 1 inch or more wide. It is rather undulating in outline, and flattened, the Peas lying at some distance from one another. It is also very brittle and juicy, showing but little thread at the juncture of the two shells of the pod. When fully ripe, the Pea itself is large, rough, of a full brown colour and rather velvety aspect. In style of growth they resemble somewhat a giant Marrowfat. The Sugar Pea is by no means delicate, and requires no special treatment; it may be sown like the other kinds, from February to the end of July, in rows about 4 feet apart. The space between the rows may be economised by sowing Spinach, Lettuce, Land-cress, Radishes, or any similar low-growing crop. To dress these Sugar Peas for the table, it is only necessary to remove the tip and the stalk of the pod; strings will seldom be found unless the pods have been allowed to get too old. After having been boiled in good soft water, to which a spray of Mint and a little salt has been added, until quite tender, they must be strained to remove water, and served plain, if the eaters belong to the rigid “plain food” school, or mixed with butter and grated cheese, like Asparagus, or better still, stirred in with the Potatoes in making an Irish stew. I have bought the Sugar Pea on several occasions from nurserymen in and about London, but have lately procured it direct from Italy, as, in some instances, I found the English seed too stale to germinate.—I.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Cutting Asparagus: B. D.—The cutting of the heads may be continued up to the last week of June, provided some heads be allowed to grow—say two or three from each crown at the end of May or beginning of June, confining the cutting to those that start from the crown after the two or three shoots to each have been secured.—B.

White Broccoli.—The following varieties of Broccoli are now showing heads as white as the finest Cauliflowers, care being taken to cut them before the protecting leaves open too much to let in the light, or sun’s rays, viz., Dilcock’s Bride, a capital white variety, the Leamington, Watt’s Excelsior, and Cooling’s Matchless—all excellent kinds. Two very late sorts, Carter’s Champion and Cattell’s Eclipse, can likewise be had with white heads, if, as soon as they show that they are coming in, the leaves are tied round them till they are wanted for use.—WILLIAM TILLERY, Welbeck.

Osborn’s Forcing Bean.—I am much pleased to see this Bean so highly spoken of in THE GARDEN, for, so far as my experience goes, it is one of the best with which I am acquainted. We have been gathering for the last three months good crops of these Beans, which are from 3 to 5 inches in length, and of excellent quality. Fulmer’s also has with me proved a good Bean, but in point of cropping not quite so heavy as Osborn’s. I have not grown Canadian Wonder, but have seen it in excellent condition with Mr. Gilbert, at Burghley.—W. M. S.

Hardy Kales.—I find that the Abergeldie variety of the dwarf Curled Scotch Kale is one of the best for withstanding severe frosts. It is likewise a good sort for supplying plenty of sprouts very late in the spring, for at the present time it is with me bearing an abundance of them, and not running to seed so quickly as some of the other varieties do. The Cottager’s Kale, when true, is another capital kind for hardiness, and the sprouts are excellent in flavour when cooked. A very old variety of Kale, the Chou de Milan, is likewise a capital flavoured sort, but it is not so hardy as some of the dwarf Curled Kales.—WILLIAM TILLERY.

SOCIETIES AND EXHIBITIONS.

ROYAL HORTICULTURAL SOCIETY.

MAY 12.

It was expected that some good Roses in pots would have been shown on this occasion; but, so far as these were concerned, the exhibition was a failure. Beautiful collections of hardy spring-flowering plants were however, furnished by Messrs. Rollisson, Parker, and Dean. From the first of these came fine potfuls of *Gentiana verna* and *G. acaulis*, a fine mass of *Iris iberica*, bearing eleven flowers; also good potfuls of *Iris florentina*, and the snowy *Trillium grandiflorum*, Solomon’s Seal, and *Dicentra spectabilis*. *Primula cortusoides amoena* was also shown in excellent condition. In the same group were likewise dense masses of the snowy *Phlox Nelsoni* and the rosy-flowered *P. setacea*, both well-known hardy species, well adapted for warm sunny borders. Mr. Parker had a well-grown group, in which were effective potfuls of the rich purple-flowered *Iris nudicaulis*, one of the dwarfiest and best of the bearded group; the golden-flowered *Euphorbia pilosa*, a free-growing plant, distinct and effective; *Phlox divaricata*, a slender-habited species, bearing lax trusses of delicate blue or lilac flowers; the spring and double flowered white *Orobis*; and fine masses of *Scilla nutans* and its delicate rosy-flowered variety. Mr. Dean staged a dozen smaller but well-grown plants, among which were one or two of peculiar interest. Of these one was a fresh and healthy mass of the Irish Butterwort (*Pinguicula grandiflora*), a plant with ovate fresh green leaves, slightly glutinous, curling inwards at the edges, and densely set with glandular hairs; its long-spurred flowers, which are nearly an inch in diameter, are of a rich violet-purple with a whitish eye. Apart from its interesting history, as recently set forth by our leading botanists, it well deserves culture as a very ornate-flowering plant. Associated with this Butterwort were well-grown specimens of the lovely blue *Lithospermum prostratum*; a profuse flowering yellow or sulphur-tinted Pansy named Sulphur Queen; the golden variegated Daisy, loaded with rosy-crimson flowers; the rich lemon-yellow flowered *Cheiranthus alpinus*, and the compact-habited snow-white *Iberis corifolia*, one of the best of its class, either for pot-culture or for spring bedding. Some examples of *Aubrietia Eyreii* shown in this collection were unusually striking. It is a plant of dense habit, and one which flowers most profusely, the blossoms individually being nearly three-quarters of an inch in diameter, and of good substance. In the class for cut flowers of herbaceous plants Mr. Parker had some fine clusters of the golden-flowered *Trollius napellifolius*, *Iberis Garreuxiana*, *Centaurea montana alba*, purple *Iris*, *Tulipa gesneriana* (with rich crimson flowers), *Spiraea japonica*, the Golden *Alyssum saxatile*, and the ever-welcome *Aponogeton distachyon*. Mr. Dean also had an effective group, in which were Lily of the Valley, the orange-flowered *Cheiranthus Marshallii*, *Polyanthus Red Rover* (purplish-crimson with a golden eye), *Myosotis dissitiflora*, purple German *Iris*, double white *Saxifrage*, golden-flowered *Madwort*, and *Arabis rosea*. Some Alpine *Auriculas* were likewise staged by the same exhibitor, and also by Messrs. Dobson of Isleworth. Mr. Dean had an effective group of double Daisies, among which were white, rose, crimson, and golden variegated forms.

Azaleas.—Half-a-dozen well-grown Azaleas came from Mr. Herrington. They consisted of conically-trained plants of Flag of Truce, one of the best of all double-white kinds; Stella, a well-known crimson-scarlet sort, shot with purple; Duc de Nassau, a large-flowered semi-double variety of a bright rosy-lilac colour; Iveryana, pure white; Sir Charles Napier, rosy salmon; and Criterion, a delicate-tinted rosy variety, spotted with crimson and variegated with white. Mr. Coles had also a well-grown group, in which were Trotteriana, rosy-lilac; Iveryana, Holfordi, a fine semi-double form, having bright rosy-crimson flowers; and Eulalie Van Geert, a delicate salmon, spotted with deep rose and margined with white. Messrs. Dobson had Criterion, rosy-salmon, margined with white; Reine des Doubles, a profuse-flowering semi-double rosy-lilac; Sir C. Napier; and Duchesse Adelaide de Nassau, an effective variety in the way of Stella.

Miscellaneous Subjects.—Fine specimens of Tree Mignonette came from Mr. Coulter, who furnished conical-shaped plants, fully 3 feet in height, and nearly as much in diameter at the base. Mr. Barnes had half-a-dozen smaller plants of the white-flowered variety. Messrs. Dobson staged nine named seedling Calceolarias, among which were Canary, a brilliant yellow; Achievement, yellow spotted, with crimson-brown; Hamlet, rich velvety crimson; and Enchantress, lilac-purple. Mr. Clarke also had a well-flowered collection. Of Roses, Mr. Herrington showed six plants in pots; and the same exhibitor was awarded a first prize for twelve cut blooms. Mr. W. Paul, who likewise staged six stands of cut Roses, exhibited his new Hybrid Perpetual, called Star of Waltham, in excellent condition. Messrs. Carter & Co. showed a basket of variegated Musk, and their new Coleus, Duchess of Edinburgh; also well-grown specimens of their Pyramidal Bouquet Mignonette. Mr. Pounce exhibited a robust-looking seedling form of *Lomaria gibba* under the name of L. Pouaeii. *Cypripedium japonicum* was furnished by the Colchester Bulb Company. It is a rare and little known plant, figured by Blume, and also more recently in the “Flore des Serres,” but never flowered in this country until this year. A seedling double Pelargonium from Mr. Woodward was thought by the Floral Committee to be a double form of *P. cucullatum*. Of Mimuluses, Mr. Dean sent cut flowers, which varied in colour from creamy-white to golden-yellow, richly blotched with maroon or crimson. Mr. Gray showed a vigorous plant of the crimson-flowered *Masdevallia amabilis*, bearing fourteen flowers. A new dwarf white-flowered Pelargonium, named Duchess of Edinburgh, came from Mr. G. Braid, Winchmore Hill. It is dwarf in habit,

and a most profuse bloomer, Mr. Laing of Stanstead Park exhibited *Caladium Madame de la Derausage*, a kind with broadly hastate foliage, creamy-white in colour, with green margins and rosy-salmon veins; *Bertolonia Van Houttei*, as shown by M. Van Houtte, has deep-green leaves, dotted and veined with rosy-carmine. A new erect-flowered *Gloxinia*, named Duke of Connaught, came from Messrs. Carter; it has flowers of rich velvety crimson inside, and pale rose outside. A small plant of *Pinguicula grandiflora* came from Messrs. Veitch; also two flowering plants of *Iris florentina*, having glaucous foliage and milk-white flowers; Mr. B. S. Williams furnished a crimson-flowered *Azalea*, named Flambeau, which obtained a second-class certificate; also *Adiantum gracillimum*. A dwarf, yet vigorous-habited, *Mignonette* came from Mr. Miles, of Brighton; it is very fragrant, and is said to be a cross between Parson's tree *Mignonette* and the old dwarf variety. A ripe fruit of *Stephanotis floribunda* came from Mr. Welsh.

Fruit and Vegetables.—Mr. Batters sent a small collection of vegetables including Peas, French Beans, Custard and common Marrows, Cucumbers, Tomatoes, and some good early Potatoes. Mr. J. Barclay had specimens of *Morchella crassipes*, or Morell, a sponge-like Fungus used by some in cookery. Mr. Sidney Ford contributed eight dishes of Apples, in excellent condition, the varieties being London Pippin, Red Pearmain, Scarlet Nonpareil, Ashridge's Pine-apple Pippin, French Crab, and Wellington. Mr. F. Dancer sent an excellent dish of well-grown Asparagus; as did also Mr. W. Allen.

First-class Certificates.—These were awarded to the following new or rare plants:

Rose, Star of Waltham (Paul).—One of the best new Roses of the year, and one which has been certificated by the Royal Botanic Society. It is a full Rose, of good substance, and bright rosy-carmine in colour, tinted with lilac. It is a free grower, and flowers profusely.

Bertolonia Van Houttei (Van Houtte).—A beautiful stove foliage plant, with ovate velvety-green leaves, dotted and veined with bright rosy-carmine.

NOTES AND QUESTIONS—VARIOUS.

Abutilon Darwinii.—This plant has proved to be hardy as tried at Glasnevin during the past winter.—W. E. G.

Pink Grape Hyacinth.—Has anyone ever seen this? Twice I have imported from Holland bulbs professing to be of a rose-coloured Grape Hyacinth, and on each occasion they have produced pure white flowers.—SALMONICEPS.

Chicory in Coffee.—The essence of Chicory, for use as a substitute or addition to coffee, is now a product of German industry and economy. If our coffee dealers would only give us the choice of coffee pure or this essence it would be well.—W.

An Inexpensive Table Decoration.—A good stubby and well-coloured plant of *Panicum variegatum*, and a few select Tulip buds make a useful combination for this purpose. The brilliant colours of the Tulips associate well with the graceful white striped Grass.—R. M.

Keeping Mice off Peas.—It may be useful to those who are now planting Peas to know that the most efficacious plan of keeping them from mice is soaking them in bitters—say bitter Aloes or Gentian. They do not affect the taste of the Peas, or in any way injure their growth.—R. M.

Standen's Manure for Pot Plants.—A large plant of *Heliotrope*, 5 or 6 feet across, was induced to flower satisfactorily at mid-winter, through being top-dressed with Standen's manure. Some large *Mignonette* plants, 3 feet through, also dressed with it, although looking yellow, and sickly before its use, soon grew away with renewed vigour.—R. M., *Abney Hall, Cheadle*.

Phlox verna as a Bedding Plant.—This pretty old-fashioned Phlox is now in use at Kew as a spring bedding plant; and, employed in combination with the pale pink *Phlox frondosa*, *Aubrietia græca*, double white Daisies, *Ajuga reptans*, and Golden Feather *Pyrethrum* it is most effective, its rich rosy-red colour being rare amongst spring-flowering plants.—A. D.

Inarching Zonal Pelargoniums.—W. E. E.—It is not necessary to use clay; merely tie with matting, and then cover with moist Moss. In about six weeks the union will be complete. Leave a joint or two above the junction on the stock; but all the shoots operated on should be shortened and kept from growing much, so that the sap may be diverted into the scions. The part above the scions will, as soon as the union is complete, need to be cut off closely.—P.

Mistletoe best Raised from Seeds in Spring.—About three weeks ago I bruised some Mistletoe berries on the branches of several Apple trees in the orchard, and to-day (4th May) I observe that the seeds have begun to germinate. I have tried them several times before by sowing the berries at Christmas and inserting the seeds in the bark of Thorn and Apple trees, but without success. It may be best to put them on in April, as in this case, and to simply squeeze the berry on the outer bark. Nearly every berry put on has commenced to grow.—R. M.

Dutch Hoes Adapted to Various Sizes of Blades.—Usually, when looking over one's tool-house, one is perplexed by the large number of tools which gardening seems to require. Of Dutch hoes, for instance, there are one or two with 4-inch blades, one or two with 6-inch blades, and one or two with 9 and 10-inch blades. Now I have found out how to make one shaft and prong do for all these sizes of blades. Let your blacksmith chop off your present blades (that is, if they are getting worn out; it would be foolish to meddle with them needlessly), and draw the prongs in to 4 inches across their ends. Then have sockets made at the ends into which the blade must be put; and the best blades I have found are those made from old worn-out scythes; they are always cheap, and they wear well.—N. H. P.

Hale's "Eden."—I am much obliged to Mr. James Britten (see p. 373), for pointing out that this work is by J. Hill; but it is catalogued at the British Museum as being the work of Thomas Hale, and the name Hale is also on the back of the volume. London says the work is by Hill, which I do not doubt. Nearly all the drawings in this interesting book are by Hill, and some of them he appears to have engraved himself. Some time ago I noted some interesting papers on old English gardening books in the "Bookseller," and I should like to procure these, if they are still to be had. In speaking of the preface to John Parkinson's "Paradisus," the author says it is "engraved on copper by Switzer;"

but on looking at my copy of the second edition (1656) the other day, I observe that it is an engraving on wood, as are all the other illustrations in that fine old book.—B.

Arabis blepharophylla superba on Rock-work.—This lovely little Alpine is now in flower on the rock-work at Kew. It has a close habit of growth, and the blooms, which are pale rosy-red and borne in neat trusses, are elevated about 5 inches from the ground. Amongst spring flowers it is quite a gem.—D.

The Peruvian Daffodil (Ismene Amœnaes).—Of this, the New Plant and Bulb Co., Colchester, say, "This, until re-introduced by us last season, and again this, was quite lost sight of." This is not correct; it has appeared for many years in Messrs. Ant. Roozen & Son's English Bulb List, and I could mention at least a dozen nurserymen who offer it, and have done so for years.—Rex.

The Edible-rooted Everlasting Pea.—The tuberous-rooted *Lathyrus* is recommended by some of the Continental journals as a substitute for the Potato. Formerly the roots were in some demand, as, when boiled or baked, they are both sweet and nutritious, but they can only be regarded as a makeshift, not as a substitute for the Potato. The plant itself is a handsome perennial, bearing purple-red flowers, which are sweet-scented.

White Swede Turnip.—I have just tasted a dish of improved white Swede Turnip, and find it to be of excellent quality. It will, no doubt, be of great use in gardens where a late supply of Turnips is required. I would strongly recommend it for such purposes; and those who have an objection to the yellow Swede on account of its colour, will find this as fine in colour as the white Stone Turnip. Messrs. Stuart & Mein state that it is beginning to be a favourite on account of its good keeping quality.—CHEVALIER.

Apple Prospects in Devon.—Orchards in Devon are now coming well into bloom, and there is every prospect of good crops. It is a common saying here that "April blossoms are no good," and that "we never knew a bearing three years in succession." This year will, however, I think, be an exception. During the last two years the crops were very heavy, and judging by the amount of blossom and healthiness of the trees in good land, we may expect an abundant crop.—J. GARLAND, *Killerton*.

Exterminating Bindweed. L. S. T.—The common means of destroying Bindweed is to fork it out, taking away every portion of the roots. This, however, cannot always well be practised, but whenever the ground is not under crop it is well to use the fork if the roots are deep. A certain remedy is persistent and regular destruction of the tops. If these are never allowed to push above the ground for more than a week without being destroyed, the roots soon perish.—B.

Rose Insects.—What is the name and best means of destroying the insect sent herewith? Several young Roses against the wall of my house have been nearly destroyed by it.—E. W. R., *Mayfield*. [*Otiorynchus notatus* is its name, and most probably there are Fir trees near the Roses, for it chiefly breeds upon them. It is not so easy to suggest a remedy. Would "E. W. R." mention in what way it attacks the Roses; if by eating the leaf, would he send specimens of the injured leaves?—A. M.]

Naming Newly-imported Lilies.—Permit me to state, in answer to Mr. Bull's note (p. 377), that "*L. Washingtonianum* new species" is Messrs. Backhouse's name, not mine. My object in writing is to prevent any but provisional names being given to newly-introduced Lilies until we know more about them than we do about *L. Washingtonianum*. Of this Lily we appear to have about three varieties, that is supposing that Messrs. Backhouse's *L. Washingtonianum* new species proves distinct from Mr. Bull's *L. purpureum*.—GEORGE F. WILSON, *Heatherbank, Weybridge*.

Vines Killed with Oil (see p. 396).—I have long since noticed, on the leaves of various hothouse plants, the effects of oil which was applied merely to show its power, the result being that the leaves were discoloured and fell off. A striking illustration came under my observation a few weeks ago, when a gardener was induced to attempt the destruction of a mealy bug upon his Vines by means of oil. Having pruned and dressed them, the oil was applied, and he has destroyed his Vines if not the bug. In one house the Vines have all turned black and are dried up, which plainly showed that there was no transpiration whatever.—WILLIAM LAURIE.

Brodiaea californica.—This plant, referred to in your last issue, is, properly, the *Brodiaea volubilis* of Baker, first introduced by me to this country, and it is, I think, greatly to be regretted that a synonymous name should be put forward. The statement that it continues to bloom and seed through the summer, after being taken from the ground, is, I apprehend, scarcely correct. This notion is due to the fact that the perianth retains its colour when dried, as may be seen in herbarium specimens. In cultivation the bulbs do not descend to any depth. The plant is very easily grown in any light soil.—W. THOMPSON, *Ipswich*.

Plum-coloured Wood Lily (Trillium atro-purpureum).—This well deserves a place in the hardy garden, where it forms a worthy companion to the white American Wood Lily (*T. grandiflorum*). It is, however, quite distinct from it in colour and form of flower. The three petals are a rich plum colour, spread flat out, with three intervening petal-like sepals of a pale green, tinged with purple, the whole being slightly recurved, and nearly 3 inches in diameter. Planted side by side with its white companion in a little artificial bed of sandy-peat, in shade and shelter, it shows itself above ground and blooms a fortnight earlier than *T. grandiflorum*.—G. F.

Forcing French Beans.—Mr. Temple surely must have glass by the acre to be able to possess 300 pots of French Beans at one time, unless he grows them in 60-sized pots. Here I find forty pots in use at one time to be quite sufficient, and only a week back I met my foreman coming out of one of the Vineries with a peck of French Beans. I am, however, afraid that the seed trade are rather mystified with regard to Canadian Wonder, for what I received for this, last year, turns out to be Red Flageolet, which is larger in the pod than Canadian Wonder. The former I grow in 16-sized pots, three plants in each, and they are so thoroughly satisfactory that I grow no other.—R. GILBERT.

Hathaway's Excelsior Tomato.—John B. Davis, of King William county, Virginia, proprietor of an establishment for preserving fruits and vegetables, wrote to Mr. James Vick last autumn the following note concerning this favourite Tomato:—"Having bought of you four pounds of Hathaway's Excelsior Tomato seed, the fruit from which we are now preserving, they have proved to be what you represented—the very best Tomato this day known for canning and general purposes. They are a wonder to every one who has used or seen them, being round, smooth, of a beautiful dark red, very solid, and cutting equal to a beef-steak. I could fill half-a-dozen sheets of paper on the merits of this Tomato, and would then feel as though I had only half spoken its praise."

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

BUDDING ROSES IN MAY.

I BUD all my new Roses early in May, and generally get about two dozen plants of them about the last week in April, all of which are in pots, and have one or more long shoots each. They are placed temporarily under a south wall, and the pots are plunged up to their rims in the soil. Here, after exposure to the air, the wood hardens a little, and, by pinching off the top of each shoot, the buds soon become sufficiently developed to be removed and inserted into Briars. I usually commence budding on the 5th of May; this year the operation was delayed to the 8th, the season being backward. The Briars which I bud are not those that were planted last November, but those which failed last summer. These, after cutting away last year's growth, on account of having good roots, began to grow much earlier than such as are newly planted, and on the 8th of May had made shoots 9 inches long, and, being full of sap, were in good condition for budding. I cut down a shoot from one of my new Roses, leaving the four lowermost buds, so that when the plant is turned out of the pot and planted out three eyes or so are left, from which good shoots are produced which bloom in the autumn. Owing to the young shoots on the Briar being very tender, May budding is a very delicate operation, and one which requires both care and judgment; and a sharp knife is indispensable. First make an incision about three-quarters of an inch in length, and not too deep; then open up the bark with a piece of ivory, or hard wood, like a pointed common black lead pencil, cut flat and thin. Now cut the bud, which need not be longer than half an inch; cut it very thin, and do not attempt to remove the wood; insert it by pushing in one side first, then take the pointed piece of ivory or wood, and work in the other side; then tie up, as usual, with cotton, worsted, or bast. I never make a cross cut, which weakens the branch so much that the weight of the future growth is almost certain to break it at the cross-cut, which may, however, be used with safety in the case of autumn budding when the wood is nearly ripe. Proceed in this way until every bud that can be taken from the shoot of your new Rose, even up to the very tip, is inserted, and the result will be that a great number of Briars will be found to have been budded with new Roses, all of which are certain to take and become firmly united. The following year new Roses will be produced by the bud, and these first Roses are said to be the best. Formerly people, when planting out their new Roses from pots, used to cut down the long straggling shoots and throw them away; but by my plan every bud is made into a standard Rose, and one soon becomes possessed of a large number of trees of the new and improved varieties. Briars planted last winter are now pushing actively into growth; but they must not be budded until the shoots are at least 6 inches long. After ten years' practice, I can bud a Briar shoot when it is only 4 inches long; but this should not be attempted by beginners. When budding is performed on shoots only 4 inches long, they often begin to curl and become distorted just above the bud, and this is a sign that the bandage around it wants easing a little. July and early in August are the next best times for budding, and the buds for use in these months are best taken from a shoot which has just done flowering. Rosarians have cause to rejoice this year at the large number of really good new Roses that are being sent out, more especially Tea-scented varieties, which are said to be unusually good. From such new Roses as have come under my own observation the following is a good selection:

Best Tea-scented of 1875.—Aline Sisley (Guillot), purplish-rose, shaded with violet (obtained a gold medal at Lyons); Jean Ducher (Ducher), yellow, shaded with salmon, very fine; Duchess of Edinburgh (Veitch), rich deep glowing velvety-crimson, a free bloomer and highly fragrant, an acquisition as regards colour; Marie Guillot (Guillot), white, tinged with

yellow, large and full form, imbricated (obtained a gold medal at Lyons); Marie Opoix, white, yellowish in the centre, much better than Niphetos, a good exhibition flower; Comte de Sembui (Ducher), salmon-rose, large and full (first prize last year at Lyons); Perle des Jardins (Levet), colour varying from pale yellow to deep canary-yellow—of the highest merit, large, full, and well formed; on account of its rich colour and continuous manner of blooming, a formidable rival to Maréchal Niel (obtained a medal last year at Lyons). Shirley Hibberd (Levet), Nankin-yellow, distinct and vigorous, a large and full-cupped Rose, to which a first-class certificate was awarded at Lyons in 1873.

Best Hybrid Perpetuals of 1875.—Hippolyte Jamain (Lacharme), carmine-rose, very large and full, an acquisition; Gonsoli Gaelano (Pernet), delicate satiny white, in the way of Souvenir de Malmaison, and very beautiful; Villaret de Joyeuse (Damaizin), large and very full, fine in form, colour delicately shaded rose-pink, a good exhibition Rose; May Turner (E. Verdier), a first-class Rose in the way of Caroline de Sansal, very large and full, fine in form and vigorous, colour salmon-rose, deeper in the centre; Colonel de Sansal (H. Jamain), carmine, shaded crimson, fine in form, large and full, a splendid vigorous-growing Rose; Comtesse de Serenyi (Lacharme), like la Baronne de Rothschild, large and full, and fine in form, colour delicate shaded rose; Antoine Moutin (Levet), bright rose with a silvery reflex, and almost as large as Paul Neron, to which it bears some resemblance; Souvenir de Mère Fontaine, large, full, and well formed, colour bright rose, with carmine centre, vigorous and good; Souvenir du Baron de Semur (Lacharme), blooms large in size, fine in form, and very full, habit vigorous, colour deep velvety-purple, shaded with black and deep fiery-red; Madame Rivière (E. Verdier), a useful variety for exhibition purposes, colour beautiful rose, very delicate and fresh; not exactly a Hybrid Perpetual, though I have placed it under this head. Among other Roses coming out this spring doubtless many upon trial will turn out good. Some of the new varieties do not show themselves in true character for several years; hence we must not condemn any too hastily, but go on patiently cultivating them, until they are proved to be worthless.

HENRY TAYLOR.

Fencote, Bedale.

LONDON SQUARES AND PARKS IN MAY.

THERE is a period of the year when, even in the heart of London, the spring foliage is beautiful—more attractive, if possible, than in the country. The contrast which the fresh leafage, and the first gush of bloom of the Lilacs and Laburnums bring to the hard and regular lines of the terraces of Tyburnia, Belgravia, and "Kensingtonia," is a most charming one—and the unusually late advent of the present splendid spring weather has been the means of keeping back the progress of vegetation, till the east winds had done their worst on naked branches and over-precocious blossoms—so that the young foliage, which has at last burst forth under the influence of a sudden rise of temperature, has not been nipped by cold nights, and remains beautifully perfect and uninjured, as it generally does in exceptionally late springs. Another advantage derived from the lateness of the present season is, that the Lilacs, Laburnums, Guelder Roses, Hawthorns, and other shrubs, which generally follow each other, are now all out in a glorious display of bloom together. In ordinary seasons the Lilacs are, as a rule, over before the Laburnums are fairly out, and they, in their turn, have nearly passed away before the white and pink Hawthorns begin to perfume the air. In consequence of the unusual advantages alluded to, Hyde Park and Kensington Gardens are just now really lovely. Entering the park by the small gate in the Bayswater Road, the diverging drives, bordered by their plantations of Lilacs, Laburnums, and Horse Chestnuts in full bloom, present a strikingly agreeable aspect. All is fresh and beautiful in the extreme, and even the sooty branches, dyed with their true London black, form a contrast with the bright and tender green of the young leaves that is very beautiful. Passing on towards the bridge, the venerable wrecks of the aged Spanish Chest-

nuts, with their symmetrically-striated and deeply-ridged bark, never fail to attract attention. It seems strange that, among the numerous young trees that are being judiciously planted, more Spanish Chestnuts, to succeed the old ones, still so beautiful in their picturesque ruins, should not be found among the number; as it is evident, from the vigorous character of the young foliage that now clothes portions of the fine old trunks, that the Spanish Chestnut is capable of defying the worst attempts of London smoke. At the stone summer-house, generally known as the Lodge, the present display of floral colour consists entirely of Tulips, and the effect is as homogeneous and pleasing as it is dazzlingly vivid; scarlet of several tones, orange, yellow, white, pink, and mauve afford a wonderful opportunity for producing striking contrasts of brilliant colour within the range of a single genus. Passing on to the "flower walk," we find the borders somewhat bare. The Hawthorns, however, in the shrubberies at the back of the border are so lovely and so sweet, double, single, red and white, that the absence of the border flowers is almost condoned by their beauty. The effect of the shrubberies, pleasant as it is, might, however, be improved and enriched by adding here and there standard plants of *Cydonia japonica*, both scarlet and flesh-coloured, and also by introducing standard Wistarias, both lavender and white. When we say standard Wistarias, we mean, of course, supported by low stakes. And why have we not splendid bushes of Clematis, also, at short distances all along the flower walk. When one sees the display which these are now making in the Regent's Park, and knows that all those magnificent flowers—of every conceivable shade of mauve, purple, white, and blush,—now being exhibited there, are perfectly hardy, it seems quite incredible that little or no use is made of their beauty to improve the floral decoration of our favourite public promenades. It may be urged that in the open ground the Clematis family would not be in full bloom at present; but, under ordinary circumstances, there would scarcely be more than about a fortnight's difference between the time of their flowering in the open air and under the protection of glass. In the Botanic Gardens, Regent's Park, the beautifully laid-out grounds are now at their best, the Horse Chestnuts being, both there and in Hyde Park, in more than usual beauty this season. This magnificent tree might well be called the Hyacinth tree, and would do more ample justice to the name than does the Tulip tree, or the Paulownia, which is sometimes named the Foxglove tree. Many other kinds of well-selected flowering trees are now in full bloom in the Botanic Gardens, and shady borders are still gay with Polyanthus, Primroses, Cowslips, and Squills. The great avenue in Regent's Park now forms a magnificent promenade, and the symmetrical gardens on the eastern side of the avenue are this year a decided success. They have been improving year by year for some time past, and their trees and shrubs have now attained to about the most attractive stage of their growth. The outlying parks of the eastern and northern suburbs are also displaying the advantages of the lateness of the season, as their young foliage is entirely unlighted by the action of those cold cutting east winds, which are but too frequently so fatal to the beauty of our early foliage and blossoms. From the same cause the foliage in the larger squares, such as Lincoln's Inn, Russell, and others, is unusually fine this season, and the trees in the terraces and villa gardens of the west and south-west are now in great beauty—white and red Hawthorns, Lilacs, and other favourite shrubs, being in profuse and healthy bloom, even in comparatively closely-built districts. A mass of Persian Lilac in Sloane Square, with very pale blush-toned flowers, is very noticeable; and, whether its flowers have assumed their delicate tone by the absence of the ordinary amount of sunlight in that situation, or whether the bush in question is an accidental variety matters little—the effect is charming. Just now, in fact, all London is, in regard to its foliage, at its very best; and, if painted, should be seen in the May of a late spring, when its Wistarias and purple Iris, which seem positively to enjoy its smoke, when they do not get too much of it, are in their prime. This season the foliage of the Wistarias is out at the same time as the flowers, which greatly enhances their beauty.

H. N. H.

NOTES OF THE WEEK.

— MESSRS. JOHN WATERER'S exhibition of Rhododendrons is, we hear, to be held in Alexandra Park this year. A spacious tent has been erected for their accommodation at the east end of the palace, and from what we know of these exhibitions a brilliant display may be expected.

— WE have received a most interesting cluster of late-flowering Bluebells or Scillas, of the *S. nutans* and *S. cernua* types, from Mr. P. Barr. These Scillas are invaluable for the decoration of the margins of woodland walks, or for that of ordinary herbaceous borders. We saw some splendid tufts the other day in the kitchen gardens at Belvoir, where they form most attractive objects in the borders. Mr. Barr is doing good service in gathering together these pretty Bluebells.

— THE old rosy-flowered Chinese tree Peony is just now a very attractive object in good gardens, its great Rose-like flowers being deliciously perfumed. We saw a specimen 5 or 6 feet in height, and quite as much in diameter, at Belvoir, the other day, profusely covered with large fragrant flowers. Tree Peonies have been introduced to our gardens since 1789. As pot plants, some of the new varieties are invaluable.

— THE meeting of the Scientific, Fruit, and Floral Committees of the Royal Horticultural Society, fixed for the 26th instant, has been postponed on account of that day being Derby day. The next meeting of these Committees will take place on Wednesday, June 2nd.

— THE Pomological Society of France have decided to invite a competition in the invention of a practical and efficacious method of destroying the American blight. A gold medal will be given to the discoverer of the best and easiest remedy, and the competition is to remain open for three years.

— A SPECIAL general meeting of the Royal Horticultural Society will be held in the Council Room, South Kensington, on Tuesday, the 25th instant, at three o'clock, p.m., for the purpose of receiving a communication from the council respecting the future prospects and condition of the society, and to receive an answer to proposals made by the council to her Majesty's commissioners.

— MESSRS. SMITH'S nursery, at Dulwich, is just now worth a visit, the new Azaleas being in excellent condition. Messrs. Smith have made themselves a name for Balsams, Calceolarias, and Cinerarias, and we recently saw some thousands of each of these favourite decorative plants being grown for seed-bearing purposes. Only 1½ to 2 lbs. of Cineraria seed is saved annually from the thousands of seed plants grown, but this seed is easily sold to the trade at from £5 to £6 per ounce. Double white Camellias are also grown here by the thousand for the nursery trade.

— THE fine old gardens at Hampton Court are just now very attractive, and the matchless avenues of Chestnuts in Bushy Park at their best. In the gardens we noted several clumps of great rosy-flowered tree Peonies in full flower, and these exhale a most delicate rose-like odour. The fragrant Wistaria *sinensis* drapes walls and trellises with a rich profusion of its delicate mauve Pea-shaped flowers. The front of the gardener's lodge, near the famous Vinery, is entirely covered with a splendid specimen of this most elegant of all Chinese hardy climbers; and a pure white-flowered variety is growing and flowering well on the old Orangery. Some of the buttresses of the last-named structure are draped with the snowy Clematis *montana*, and we also noted it in other parts of the garden flowering most profusely. This Clematis, and the white-flowered Wistaria ought to have a place in every garden.

— "FOOD PLANTS of the Larvæ of the British Lepidoptera," by Owen Wilson, Barrister-at-Law, is the title of a new work that will shortly be published on this subject, in twenty monthly parts, illustrated by forty beautifully coloured illustrations from Nature. The first portion of the work will contain a list of caterpillars according to Mr. Doubleday's arrangement, with their scientific and English names, their form, colour, and description, the time they feed, and the plants they eat, and, when necessary, the localities in which they may be obtained; also the time and situation in which the chrysalis is found, and the month in which the perfect insect flies. There will be an alphabetical list of plants, with their English and botanical names, and the names of the caterpillars which feed upon them. Following this will be a calendar of the months in which the caterpillar may be found, another showing when it is in the pupa state, and a third giving the time when the butterfly or moth appears on the wing. The work is intended to enable the entomologist (and also the amateur) to detect at once the perfect insect upon finding the caterpillar and its food plant. Should the naturalist obtain the caterpillar without a clue to its food plant, the calendar of months, and the descriptions together, will, it is hoped, enable him to find it

THE FLOWER GARDEN.

CARNATION CULTURE.

IN order to have this beautiful flower in perfection, the principal thing to be done is to obtain soil in which it cannot fail to flourish, for it is an ascertained fact that there is no natural soil in this country that answers all the requirements of the plant. Yet, unless such be in some way provided, the time, labour, and money of the cultivator are alike thrown away. The first thing to be secured is some good loam, which should be obtained from maiden ground, the top spit only being useful. The loam must not be so strong or clayey as to adhere to the fingers when crushed; but must feel soft and oily. The following, which is the compost used by an old grower of Carnations and Picotees, will, with proper attention, secure success. Take two barrowfuls of maiden loam, one barrowful of good black soil, two barrowfuls of thoroughly-rotted horse-dung from an old Cucumber bed, and about half a barrowful of coarse clean water-sand, or any sand that has been thoroughly washed with water. If the loam happens to be of a somewhat stiff nature, the quantity of sand must be increased. These ingredients will form a suitable compost, and the heap must be kept a year at the least, and frequently turned, especially in winter during frost, in order to get it thoroughly mixed. Whilst this is being effected, a little hot lime should be thrown in, which will be found of great service in killing insects, which are very destructive in eating the tender roots of choice varieties. A little lime has also an excellent effect on the soil, which is much sweetened by its application. The method of propagation is by pipings, or by layers, and the best time for taking these is when the plant has come into bloom, and before it is too far advanced, otherwise they will have become hard, and are apt not to strike so easily. A quantity of sand deposited round the base of the plant greatly assists the layers to root. In order to raise double flowers of Carnations and Picotees the best seed only should be procured. Go only to the most respectable dealers, where, though you may, perhaps, pay a high price, you will at least obtain what you want. When you get good seed do your best to save it yourself; the best varieties do not yield much seed, hence it is rather dear. April and May are the best months in which to sow the seed, which must be done either in small beds made up for the purpose or in large pots; the seed must be lightly covered with fine compost. When the plants are large enough, which will probably be the case the following February or March, they must be planted out in a bed prepared with the compost

before described; the distance between the plants should be 10 inches. Before the flower-stem makes its appearance the pots, if the plants are in them, should have a top-dressing of good compost, water being given during the growth of the stem and the swelling of the flower-pod. As the plants advance care must be taken that the pods have no tendency to burst on one side; this may be prevented by gently tying with a shred of bast, or, if it is obstinate, the opposite side of the pod may be slit with a sharp knife. About this time the

side shoots should be taken off and the bloom-pods in the truss reduced to the number which the stem can properly bear. After the growth has advanced a little further, circular pieces of card should be put round immediately under the flower, and the guard or lowest series of petals spread neatly upon them; then paper caps or small shades of glass must be suspended over the flowers in order to prevent the sun and rain from injuring the colours, and should be removed towards evening to give a little air. If these precautions are taken the blooms may be obtained in the greatest possible perfection. If the plants are to be bloomed in pots the latter should be very large, and the plants transferred to them in March or early in April, after which the treatment is the same as for those in borders or in beds. In winter the plants should be secured from very severe weather by hoops and mats, or similar means, but they should still have as much of the free air as possible on all favourable occasions. Carnations require free exposure to pure air, except at times when this would affect the colours of the blooms, and then the latter must be protected by shades of glass or paper as before described, but the Grass must be left as freely exposed to the air as possible. Carnations are usually divided into three classes—Flakes, Bizarres, and Picotees. The Flakes have the colours in broad stripes, seldom more than two in number—white being the ground colour, and the second colour any shade from deep purple to the palest pink of the Peach blossom. The colours of Bizarres are usually broken into stripes; and this kind is dependant for its beauty on the proportion of the various tints, and the manner in which they are contrasted. Carnations are



Armeria mauritanica (see p. 421).

best known as scarlet Bizarres, crimson Bizarres, pink and purple Bizarres; scarlet Flakes, rose Flakes, purple Flakes, and pink Flakes. Picotees are differently marked, being dotted or marked over with little spots, and their colours being in greater breadth. A good deal of their beauty depends upon the tint and brilliancy of these dottings. There are purple-edged, red-edged, rose-edged, and scarlet-edged; these are on a white ground generally, but many very beautiful varieties can now be procured having a yellow ground. There

are also many beautiful varieties of the scarlet Picotee, such as Attraction, Fellows's Attraction, and Miss Osborne. It is very difficult to say which of the Picotees is to be preferred, for there are many varieties, all of which are exceedingly beautiful. In addition to colour, the flower should be of ample size, the petals finely formed and arranged, and the Grass or stem supporting the single flower or truss should be strong, and of a healthy colour. These conditions can only be secured by growing the plants in a suitable compost. Good Carnations and Picotees can now be bought at very reasonable prices—indeed, almost as cheap as common scarlet bedding Geraniums. I often grieve to see good varieties grown as they are in most of our gardens in front of villa residences. Many appear to have an idea that if they make a hole in the soil, and put in the plant from its pot, that it will grow into a fine specimen. It cannot be expected that persons unacquainted with the culture of the Carnation can be expected to bring it to such a state of perfection as an experienced cultivator, who makes it the peculiar object of his care and study, can; yet much may be done by the amateur, if the advice I have given respecting compost be followed. At the proper season of planting, which is March or about the first week in April, dig a hole in the border or bed where the plant is intended to bloom, fill in two good spadefuls of the compost, and then insert the plant, giving a good watering to settle it in the soil. The plant will flourish much better this way than if planted after the manner formerly adopted, which consisted in scratching a hole in the border about 3 inches deep with the fingers, inserting the favourite plant, and then pressing down the soil, by which procedure the roots are broken.

HENRY TAYLOR.

Fencote, near Bedale.

THE LILIES.

By C. M. HOVEY, Ex-President of the Massachusetts Horticultural Society.

THE readers of THE GARDEN must feel deeply indebted to you for the re-production of Mr. Baker's exhaustive paper on all the Lilies, beautifully illustrated as it is by you. It straightens out and makes plain much of the confusion which has existed in books, and especially catalogues, of these most beautiful plants; and a careful study of the paper and illustrations, and an equally careful examination of the plants by intelligent cultivators will soon weed out the synonyms and establish a true nomenclature. I have often been surprised at the apathy which exists in regard to the culture of Lilies; and had long ago come to the conclusion—as they were especial pets of mine—that I had overrated them, and inferred neglect when there was really none. For more than thirty years I have grown all the principal sorts that could be obtained in European collections, and, without mentioning the regular autumn trade sorts, have had all that were really hardy in our climate; but my real pets have been the Japan sorts of the speciosum type, introduced by Dr. Siebold. These have been erroneously known under the name of lancifolium, and its different varieties, as rubrum, album, roseum, and punctatum. The first was crimson spotted, the second fine white, the third rose spotted, and the last blush or pink spotted. Of these I have ever been curious to know in what manner the punctatum originated, as it has a habit which none of the others has. It always comes up in the bed several days before the others, keeps ahead, and flowers fully a fortnight sooner than they do. So much in advance, indeed, is it, that I have had the shoots badly nipped by late frosts when the others, just coming out of the ground, were not in the least injured. In fact, after some disappointment and trial of two or three years, I took it out of my show bed, as it spoiled the general effect, by the decay and loss of its flowers, leaving only bare stems when the other varieties were in their prime. My first strong bulbs of these Lilies were purchased of the late Mr. Groom, whose nursery at Clapham I visited when in London in August, 1844. I selected the bulbs then in bloom, paying him £5 for speciosum (lancifolium rubrum as he called it), and £2 each for album and punctatum, and these were sent to Boston to me as soon as they were in condition to move. They came to hand late in November, but in fine order, and were carefully potted and treated, placing them in a cool house until

they began to grow, re-potting them when they required it, and in June following they flowered in great perfection. Each plant bore from fifteen to twenty flowers, which were admired by all who saw them. These Lilies, at that time, were very rare, and so striking was the speciosum that I made a drawing of the plant as it stood in the pot, and an engraving of it appeared in my "Magazine of Horticulture," for January, 1848 (Vol. XIV., p. 36). At that early period the hardiness of these Lilies in our severe climate had not been tested, and as the bulbs were rather too expensive to make the trial, it occurred to me to save their seed, and to ascertain in that way whether they were hardy or not. Of course, my first object was to hybridise; but, as I had then only the album, punctatum having done blooming, speciosum was fertilised with album, and *vice versa*. The result was that every individual blossom produced a pod of fine plump seed, and in three or four years we had many thousand seedling bulbs, fully grown and in bloom. Seeing how readily fertilisation was effected, I thought I would try still further to ensure hardiness, and next season I potted bulbs of tigrinum, canadense, superbum, longiflorum, and candidum, so as to have them in bloom at the same period as speciosum. All succeeded, and I had no fewer than twelve packets of seed, the result of fertilisation, from which I raised the finest of all the Lilies of the type yet produced, including the variety known as Melpomene, each petal of which is completely covered with blood-red, excepting a clear white border on every petal, and the papillæ which are of a black-crimson. In some of the hybrids the form was completely ruined, such as candidum and longiflorum; but the old speciosum album, fertilised with tigrinum, yielded very beautiful deep-coloured flowers. For upwards of fifteen years I continued to grow these Lilies from seed, and produced many fine kinds; but none to exceed Melpomene.

In 1862, *L. auratum* was introduced to this country. Simultaneously with its introduction to Britain it flowered with Mr. Francis Parkman, now president of the Massachusetts Horticultural Society, and was described in my magazine, where the name of *L. Dexteri* was suggested, as Mr. Dexter brought the bulbs from Japan. Mr. Baker has evidently read the article, as he quotes *L. Dexteri* as a synonym on my authority. It at once occurred to me what a mine of beauty it was, and how much might be worked out of it by crossing it with the speciosum; therefore, begging a single anther of it from my friend Mr. Parkman, I took it home for experiment. I happened to have *L. Melpomene* in bloom, and the flowers of that were properly fertilised with *auratum*, but only one perfected seed (probably from the insufficiency of pollen), and only six or eight perfect seeds were secured. These were duly planted, and in time some six or eight plants were the result. These all bloomed just like the female parent—all, till the last one began to unfold the petals of an immense bud, when a flower was revealed with which *L. auratum* at its best could not compare. It was 12 inches in diameter, of just the form of speciosum, though not half so much reflexed, pure white, with a deep crimson band and deeper coloured papillæ. Like all good things, it was allowed next year to perfect a large number of flowers when it was exhibited, and the following is the report which was given of it:—"The plant, which was 6 feet high, with a stem nearly an inch through at the base, bore eleven flowers, forming a pyramidal spike nearly 2 feet broad, each flower being 12 inches in diameter . . . It is, in fact, a gigantic form of the Japan Lily, and for stateliness, magnificence, and beauty stands unequalled among all the known Lilies."

From 1850 to 1865 I cultivated four beds of Japan Lilies, numbering several thousand bulbs; an awning was erected over the beds, and from August 20 to October 1 they were in fine perfection. *L. Browni* (Van Houtte), is another grand Lily. Is it different from *L. japonicum*? *L. longiflorum* is a fine Lily, but it is not so hardy as candidum or speciosum. A bed of it 50 feet long, loaded with its great trumpet-shaped fine white flowers, is a glorious sight. *L. eximium* is too much like longiform, *i.e.*, if I had the true sort from Van Houtte. *L. Takesima* is a great improvement on longiflorum; it produces more flowers, and the outside of the petals have a slight brownish tinge. *L. testaceum* is a desir-

able Lily, but its lanky stem and meagre foliage detract from its otherwise good qualities, particularly the very distinct colour of the flowers. Our American Lilies are very showy and beautiful, but their treatment is often misunderstood, as the bulbs of our Eastern sorts are all annual, flowering but once. Our botanical works say nothing of this, and a great many years ago I failed to bloom them, as I set out the old bulbs. I soon, however, discovered my error when digging them from their native woods; and, again, they are fastidious as to soil. They never do well in loam, and only flourish in a very loose peaty earth, in which American plants are generally grown. *L. canadense* and *L. superbum* will succeed in any wet place; but *L. philadelphicum* will only thrive in a comparatively dry situation. In July, 1873, I dug up bulbs of the latter in their native habitats, by the sides of roads and in peaty pastures, in full bloom. These were laid in a box of sandy peat until October, when they were planted for convenience in boxes a foot square and 6 inches deep, and last July they all flowered beautifully and produced a quantity of seeds. Its deep orange-crimson flowers spotted with black-purple, erect habit, and tiny foliage, make it very attractive; bulbs of it not much larger than a Pea often produce one flower. *L. canadense* is indigenous in my grounds, where I have dug up quantities before they were cleared and planted, and even now, where a spot is neglected for two or three years, plants of it spring up, showing their nodding yellow-spotted flowers, probably from scales, dormant bulbs or seeds lying in the soil. *L. superbum*, our grand Lily, might well be taken for an improved variety of *canadense*, as the only material variation is the size of the flowers, their deeper colour, and its more reflexed petals. Mr. Baker, I think, commits an error where he states that the "Bulbs are large, cæspitose, globose, perennial." This is not so; the bulbs are not globose, nor perennial. In fact, this Lily is precisely the same as *canadense*; the bulb flowers but once, and emits a runner to take its place. I have been through swamps in which it grew 7 feet high, with from ten to twenty flowers; I have dug up hundreds of bulbs of it, and had a bed 80 feet long and 5 feet wide of *superbum* and *canadense* for nearly ten years. You will almost always see the old dry stalk standing about 4 inches from the new shoot, and anyone knowing the habits of this Lily can dig it at any time after flowering, before frost, from the old dry flower-stems. They grow most abundantly among thickly-matted roots in peaty swamps, where it is almost impossible to dig them except by means of a sharp hatchet and very strong spade. Mr. Baker could not have had for his description a true *superbum*, of which I should be glad to send him bulbs, direct from their native haunts.

It is singular that none of our cultivators have had much success with the Californian Lilies. *Humboldti* and *Washingtonianum* have been sent to us in quantity, but we have never yet had the good luck to see a flower. Probably they are not hardy enough for us, and under pot culture we have not yet succeeded. We hope for better things in the future. A valuable addition to your article would be an alphabetical arrangement of the varieties and synonyms in the reference to the species as designed by Mr. Baker.

Boston, May 1st, 1875.

LILIUM WASHINGTONIANUM.

PERHAPS I can, by stating a few facts, throw some light on the much-vexed question as to *L. Washingtonianum* and its varieties. It was I who first introduced the plant in 1869. The bulbs were gathered in the Sierra, photographs taken of the flowering stems at San Francisco, and, if I remember rightly, a comparison made with Dr. Kellogg's specimen. Now, some of these bulbs measured as much as 5 inches through, and had flowered with as many as seventeen blooms; but, owing to the requirements of the plant, which I did not fully know, even the strongest bulbs produced only from three to five flowers, which were very fragrant, tipped with white, and scarcely changing to rosy-violet; the leaves were glaucous. Afterwards I received from Oregon a bulb as *L. Washingtonianum*, which had a flower-stem like the Lily figured in THE GARDEN (p. 300). The flowers were white, changing rapidly to a beautiful rosy-violet, much brighter than that of the flowers of those imported in 1869; the substance of the flowers was also better; the leaves were not so

glaucous, but a good green. I am of opinion with Mr. Wilson, that the plant is very variable, and produces forms running into each other to such an extent that it is somewhat difficult to see which is the typical form. I suppose the specimen figured at p. 343 has been found growing under circumstances very favourable to its development. I doubt, however, whether there are bulbs of this peculiar species now in Europe, or whether this very obstinate species will ever be brought to perfection. I had *L. purpureum* from one of Stevens's sales, but there is not a "satiny bright purple" in the flower, but rather a dull rosy-violet. But this "sub-species" or variety of *L. Washingtonianum*, on the authority of Mr. Baker, is of easy cultivation. Messrs. Sievers & Miller, of San Francisco, called it the "Eel River" variety. The leaves are a very dark bronze-green in colour. The question will be settled soon, when the plants will be in flower side by side, and will be carefully studied by those engaged and interested in Mr. Elwes' great Lily work. *L. Bloomerianum* is another name given to *Humboldti* by Dr. Kellogg, but the name *Humboldti*, having been provisionally given by Roezl and the description made by M. Duchatre in 1870, claims priority. *L. Humboldti ascellatum* is said to be a fine variety. Permit me to add that, since the above was written, I have had more positive information than my own in reference to *L. Washingtonianum*; and it appears, after all, that Mr. Wilson is perfectly correct in his assertions—viz., that there is—1. *L. Washingtonianum*, properly so called—that one named and described by Dr. Kellogg, which in itself varies much in substance and in the colour of the flowers, according to soil, situation, and geographical distribution. 2. *L. Washingtonianum* (*Eel River* variety), flowering in an umbel, like the figure on p. 300, and of a dull rosy-lilac-purple, and having reflexed petals. *L. purpureum*, of a satiny-purple, changing to bright lilac, as stated by Mr. Bull, the petals being very much reflexed and raceme-flowered. Whether or not these three different plants are to be regarded as species, properly so called, as sub-species, or as varieties, will doubtless be settled by careful examination this summer.

MAX LEICHTLIN.

Baden Baden.

LARGE-FLOWERED THRIFT.

(*ARMERIA MAURITANICA*.)

THE plant, of which the illustration (see p. 419) is a representation, and of which we here give a flower head of the natural size, is superior in appearance to all others of the same genus, and well worth a place in every garden. It is sometimes confounded with *Armeria*



Large-flowered Thrift (natural size).

plantaginea, which, however, is perfectly distinct from it, and inferior to it as regards size of flowers, brilliancy of colour, and size of foliage. It requires a light sandy soil, and, if its roots be covered during winter with a mulching of dry leaves, it may be left out of doors all the year round with impunity. It flowers in May and June; and its propagation is effected by division, or it may be raised from seed.

F.

The Fragrance of Flowers.—Sometimes the sweetest flowers we have, like *Mignonette* and *Sweet Peas*, are entirely destitute of fragrance. This occurs on particular days or portions of days, and may be caused by a peculiar condition of the atmosphere; but we have known a bed of *Mignonette* to be destitute of fragrance for a whole season, for which we could give no satisfactory reason.—JAMES VICK.

THE INDOOR GARDEN.

THE AURICULA.

THE Auricula is a plant that must be grown by itself; one cannot mix it up with others. It needs a low, shaded, cool house, or a cold frame in an airy position; it requires special treatment, and must have it if the cultivator is to succeed with it. We attended the annual exhibition of the National Auricula Society, held the other day at Manchester, where a great number of plants were staged in the several classes; but, with the exception of some from that well-known cultivator, Mr. Turner, Royal Nursery, Slough, all the plants came from Lancashire and Yorkshire. Cultivators of Auriculas in these two counties assert that they are deluged with applications for spare plants from anxious purchasers. They also state that the taste for the Auricula, which for a time declined, is now rapidly increasing, and that this time the old-fashioned flower is the subject of a very pleasing revival—a gratifying piece of information.

Show Auriculas.—These are so named to distinguish them from the Alpine section. Show Auriculas are divided into four classes, viz., grey-edged, white-edged, green-edged, and selfs. A flower of either of the three former should have a yellow or golden centre or throat; round this a zone of pure white, which is covered with a dry mealy substance, known as the paste; then a ring of what is known as the body colour, generally a shade of violet, purple, plum, red, or maroon; and then the edging, which is also covered with a slight paste. The grey and white-edged flowers come very near to each other, and it is only a practised cultivator who can distinguish the merely technical difference between them. On the other hand, the green-edged flowers are quite distinct in character; the edge is of a lively pea green, with a slight powdering of meal, more or less dense according to the variety. One of these flowers must be looked into to perceive its great beauty, and its marked individuality of character. It is a flower that may be said to invite inspection; it must not be passed by as one would a flower whose properties can be detected at one glance. The self flowers have a white ground colour, with a broad marginal body colour of yellow, violet, mauve, red, purple, maroon, velvet, &c.

Culture of the Auricula.—This is by no means a difficult process, but he who would succeed must be attentive and painstaking. The show Auricula requires pot culture, and a soil rich in vegetable mould, or stable manure, or cow-dung well rotted and dried sufficiently, so that it can be rubbed to pieces by the hand, mingled with a good and rather strong yellow loam, and with the addition of some silver-sand or peat earth to keep it porous. Some pieces of turf cut from a pasture, and allowed to lie for a year or two to become rotten, should be added, and the compost should be well mixed together, and turned and exposed to the open air before using it. It need not be very fine; lumps of fibry matter are a good thing in Auricula soil, according to the testimony of one of our most successful cultivators, the roots spread more readily in it, and the plants do better in consequence. In potting, the collar of the plant should be even with the surface of the soil; and, in the act of potting, any leaf showing symptoms of decay should be removed.

Propagation.—Auriculas may be raised from seed, and named varieties by division of the roots. The Auricula throws up side-shoots from the collar of the plant, generally just beneath the soil. It is the rule to remove these soon after the blooming plants have done flowering, and when the old leaves begin to decay. Generally, they will be found to have small pieces of root adhering to them; but, even if they have not yet sent out rootlets, they will soon strike root. These small side-shoots should be put singly in small pots, using the Auricula soil above mentioned, which should be pressed firmly about them, and the shoots put into a frame in a cool shady spot and kept from the sun. A slight sprinkling will be all that is required in the way of water.

Treatment after Flowering.—As soon as the Auriculas have done flowering, which is generally by the middle or end of May, it is the usual custom with some cultivators, to set the plants out of doors on a dry hard bottom, where the plants can receive all weathers but the mid-day sun, until July, by which time they will have perfected the side-growths referred to above, when they can be removed and potted as already directed, and the parent plants protected from heavy rains. Others keep their plants in cold frames during the summer, and do not expose them, especially in the south of England. In August, the plants are turned out of the pots, the soil shaken out, the roots examined, and all injured, cankered, or diseased ones removed, and then re-potted in new soil. After potting, the plants are slightly watered, and put into a cold frame.

Autumn and Winter Treatment.—Good drainage is indispensable to the Auricula; therefore, in potting put a good number of broken crocks at the bottom of the pots, for an efficient drainage has much to do with the well-being of the plants during the autumn and

winter when they are at rest. The frame in which the plants are placed after potting should be dry and airy; hence it is that Auricula cultivators have frames specially constructed for the purpose. The elevation is higher than ordinary frames, with wooden shelves up near the glass, and so fixed that there can be a free circulation of air beneath them. Damp is a great enemy to the Auricula during the winter; at the same time, a dry artificial heat would be even more injurious. In open weather the plants should have all the air that can be given them; but, in damp weather, or times of severe frost, or during the prevalence of nipping easterly winds, let them be kept closer. The plants must be occasionally examined, to remove any decaying leaves or signs of damp. But little water is required in winter time, and only when the soil is quite dry about the roots. Give water on a sunny mild day, and stand the plants outside of the frame, when it is administered, so as to keep the interior of the frame as dry as possible. We have here endeavoured to lay down certain general rules. There are many minor points which are soon learned by cultivators, for there is nothing like the teachings of experience in achieving the successful culture of plants.

The Alpine Auricula.—It is supposed that the show Auricula is a variety of the Alpine, though there appears to be almost specific differences between them. The Alpine is of a hardy constitution, and the commoner forms will do well in the open border. Of late years a great improvement has taken place in this lovely flower, and Mr. Charles Turner, of Slough, has been eminently successful in raising new and improved varieties. By strict Auricula fanciers, and at the exhibitions of the National Auricula Society, the Alpine section is divided into two classes, viz., those with golden, and those with white centres. What appears to be an arbitrary distinction is set up, for it is required for exhibition purposes that the flowers with yellow centres should have two-coloured margins, a dark body colour paling off to a lighter hue, as for instance, purple to mauve; a plain to lilac-pink; while the white-centred flower must have a marginal wholly of one hue. There must be in the first what the northern growers term shading; but the second section must be destitute of it. Mr. Turner has raised many splendid varieties that set these laws—laws as far as the exact northern florists are concerned—altogether at defiance, and they are really grand from a decorative point of view. We have now in our conservatory, doing well under the shade of large plants, certain Alpine Auriculas growing in pots, some having golden, and some white centres; and they are the admiration of every one who sees them. They are seedlings raised in a very simple manner.

Raising Seedlings.—Make up a fine soil—loam, leaf mould, and sand—and put it in a well-drained pan or shallow box, and then sprinkle the seed thinly over it, and gently press it into the soil. Then carefully sprinkle the surface with water, place a piece of glass over the pan, and put it away in a cool frame, or under a hand-glass in a shady spot, and in a few weeks the young plants begin to appear. Sow in March or April if possible; the earlier in the year the seedlings are raised, the larger and stronger will be the plants when they come into bloom a twelvemonth later. As soon as the plants are large enough to handle, let them be pricked off into pans to encourage their growth, and later on potted singly into small pots, and wintered in a cold frame. When they flower, all the best should be marked, and kept for cultivation in pots; the inferior varieties should be planted out as border flowers, and when they become established they make very efficient border flowers.—“Land and Water.”

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Standard Fuchsias.—Standards with a clean stem, 1, 2, or 3 feet high, and a good bushy head, are very suitable for placing amongst other plants, as, for example, in the centre of a group, where nothing but the top is seen. To obtain them in this form, when struck from cuttings, the points should not be taken out, but should be allowed to proceed upwards to the desired height, when they may be stopped, and the side-shoots soon form a head. Growths which may appear on the lower part of the stem should be rubbed off, and a strong clean stake should be put to each plant to keep the stem straight and to support the head.—M.

The Peach Palm.—Pupúnha, or Peach Palm (*Bactris Gachipaës*), is one of the most beautiful and useful of Palms of the Amazon, growing generally in clusters from 60 to 90 feet high, and thickly armed with prickles. Its numerous drooping leaves, 7 feet long, have from sixty to seventy pairs of leaflets pointing in all directions. Under the deep green vault hangs the huge cluster of fruit, yellow and red when ripe, about seventy-five in number, and making a load for a strong man. It is, according to the “Scientific American,” nowhere found wild, but is seen in cultivated spots along the whole river.

Lilium Kramerii.—In a letter recently written by Mr. Hogg, from Japan, to his brother, the editor of the “American Garden,” he says:—“Besides *L. auratum* another new Lily has been found. Some two or three years ago the first of them were sent to England and, I believe, it has there been named *L. Kramerii*. Its general character is that of *L. longiflorum*, of which eventually it may prove a variety; only its flowers, instead of being white, are of varying shades of pink colour. Coming from the southern part of Japan, it probably will not prove hardy; but for greenhouse or frame culture it will be an acquisition of no little merit, owing to its beautiful shades of colour.”

THE WINDFLOWERS.

At this season, when the fields, and hills, and gardens, of Europe owe so much of their beauty to the *Anemones*, a series of illustrations of such species as are in cultivation will no doubt be of interest to all who grow hardy flowers.

White Windflower (*Anemone alba*).—This is best described as a dwarf and stout *Anemone sylvestris*, and is a native of Dauria, Russian Asia, the Crimea, and, doubtless, the Caucasus. The leaves are only a few inches high, and the handsome white flowers, somewhat like those of the fine large-flowered variety of *Clematis montana*, rise an inch or two above them. Till plentiful, it should be grown in deep fibry loam on the rock-work. Flowers in summer; 4 to 6 inches high. Propagated by division and by seeds. The figure of this in the "Botanical Magazine," 47, 2,167, does not do justice to the plant, and we have been unable to find a specimen of it to figure.

Alpine Windflower (*Anemone alpina*).—This is almost too stately to be classed with the dwarf plants that we usually term Alpines; but high on nearly every great mountain range in northern and temperate climes it is one of the most frequent and best-marked plants. It may be seen in every stage on the same day, and on the lower terraces of the great mountains and in the green slopes of the valleys it assumes somewhat about the same proportions as in our gardens. It is distinct from most of its cultivated brethren in its large and much-cut leaves, its size, and the very soft down on the exterior of its flowers. The interior of the flower is white, the outside being frequently tinted with pale purplish-blue. It grows from 4 to 18 inches and even 2 feet high. Being of a vigorous character it should, if placed on rock-work, have a level spot with abundance



The Alpine Windflower.



Flower of the Alpine Windflower.

of soil to grow in; and, being also tall for an Alpine plant, it would be the better of close association with neat shrubs, plants of the stature of the vernal *Adonis*, and the better kinds of *Aquilegia*. They would afford each other protection. Where the soil is good it grows quite freely as a border plant; it flowers in its native country as the snow disappears, and in our gardens in the end of April or beginning of May. When plants are well established in good soil they may be taken up and readily divided with advantage to themselves; it may also be raised from seed. Visitors to the Alps might bring home quantities of the seed, which ought to be sown as soon as possible after being gathered. Sometimes the flowers are yellow, in which state the plant is often known as *A. sulphurea*.

Great Hepatica (*Anemone angulosa*).—Every one who knows the charmingly bright flowers of the variously coloured varieties of the common *Hepatica*—the very bravest of our early spring flowers—will welcome this species, fully twice the size of the common *Hepatica* in all its parts, with flowers of a fine sky-blue, as large as a crown piece, and distinguished from the common kind by its five-lobed and toothed leaves. It is a native of Transylvania, and hardy everywhere throughout these islands. Obviously the only thing to determine about such a valuable addition is how to best grow and enjoy it. It is naturally more an inhabitant of the elevated copse than the crest of the Alps, and is not able to flourish when thoroughly exposed to the fiercest blasts, like the little Alpine plants that cushion down their stout, if diminutive, leaves shorter than the very Moss, so that injury from the fiercest gale is out of the question. I have seen it in sandy soil in a thin shrubbery attain a height of more than a foot when not in flower, and the shelter and slight shade received from surrounding objects is decidedly favourable to its development. In all properly formed rock-works, or in their immediate vicinity, it will be possible to give

it a suitable position; while in spaces between American plants and choice dwarf shrubs in beds it will succeed to perfection. When plentiful enough, it may be used as an edging to beds of choice spring-flowering shrubs, and for planting in wild open spots in shrubberies, or in open, rather bare, and unmown spots along the margins of wood walks. Let us hope that time will see it sport into several colours like its relative, our common *Hepatica*, one of the oldest, as well as brightest, inhabitants of English gardens.

Apennine Windflower (*Anemone appennina*).—This has erect flowers of a bright sky-blue. These star-like flowers are larger in



The Large-flowered Hepatica.



The Apennine Windflower.

size than a half-crown piece, and are paler on the outside than within. The plants grow in dense tufts, so that, though there is but one flower to a stem, they are thickly scattered over the low cushion of soft green leaves. Although figured in most of our works on British plants, and naturalised at Wimbledon Park, Cullen in Banffshire, Tonbridge Castle in Kent, and various other places, amidst the groves and shrubberies of all parts of these islands, it is welcome in the garden and on the rock-work; but it will be only when we see it scattered amongst and contrasting with the natives *Anemones* in our woods, or making glorious mixtures of gold and blue with the Buttercup-like Windflower in open spots along shrubbery walks, or running wild among any other dwarf plants with which the woods or pleasure-grounds are graced, that we shall be able to realise the fact that this Italian beauty can add a new charm to the British spring. The Apennine *Anemone* flowers in March and April, is very readily increased by division, and grows about 4 to 6 inches in height.

Winter Windflower (*Anemone blanda*).—This is a near relative of the Apennine Windflower, and a very lovely plant, deserving to be cultivated in every garden in the British Isles. It is of a fine deep sky-blue, like *A. appennina*, and has larger and more finely-rayed flowers, dwarfer, harder, and smoother leaves, and blooms in the very dawn of earliest spring, during mild open winters, and in warm parts showing as early as Christmas, flowering continuously



The Winter Windflower.

too, so that it may be seen in flower late in spring with its relative *A. appennina*. It is perfectly hardy and vigorous, and, from the harder and smoother texture of the leaves, can stand exposure to cutting winds and sleets even better than the very hardy Apennine *Anemone*. In a word, it combines every good quality of a hardy Alpine plant; should be grown on every rock-work, or planted on bare banks that catch the early sun in the pleasure-ground; should adorn the spring garden, and, when sufficiently plentiful, might be naturalised in

half-wild places along with other free and hardy members of its charming family. It does not grow more than 4 inches high, and is multiplied easily by division. Botanically this is chiefly distinguished from *A. apennina* by its carpels being topped with a black-pointed style, and by the sepals being smooth on the outside.

Poppy Anemone (*Anemone coronaria*).—A native of sub-humid pastures in the south of Europe, this plant has been one of the most



A Florist's Anemone.

popular in our gardens from the very earliest times. There are a great number of varieties, both single and double, all worthy of cultivation, and great ornaments of the spring garden. The single sorts may be readily grown from seeds, and they should be thus raised by those wishing a large stock of effective spring flowers. Infinitely



A. coronaria (single).

A. coronaria (double).

varied as they are in colour, and possessing most vigorous constitutions, they deserve to be cultivated even more than many double varieties annually offered by our seedsmen. The plantation of these double varieties may be made in autumn, or in spring, or at intervals all through the year, to secure a continuity of flowers; but the best bloom is secured by September or October planting. The Poppy Anemone does best in a rich deep loam, but is not very fastidious. The roots of the more select kinds may be taken up when the leaves die down; but they are in few cases worth this special attention, simply because many splendid varieties may be grown as readily as any native herbaceous plant, and we had better cultivate new and distinct species of hardy plants rather than the numerous varieties of one kind. If the seed be sown in June, and the plants pricked out in autumn, they will flower very well the following spring, so that this fine old plant may be said to be almost as easily raised as an annual. Flowers in April and May, and often through the winter; red, white,

and purple, in variety. Height, 6 to 9 inches. Propagated readily by seed or division.

Scarlet Windflower (*Anemone fulgens*).—The white Lily is not more conspicuous for its purity among the border flowers of summer than this plant for its fiery brilliancy amidst the flowers of spring. It is perfectly hardy—vigorous too—the large scarlet flowers being boldly supported on stems about a foot high, springing from a dwarf mass of hard deeply lobed and toothed leaves. A native of Greece and Southern Europe, it is by no means common in gardens, and is, indeed, unknown to the majority even of those who grow and care for spring flowers; but it will ere long become popular, being one of the noblest ornaments of spring, and, as a scarlet flower, almost unrivalled. It is admirably suited for culture



The Scarlet Windflower.



Haller's Windflower.

as a border plant, indispensable for the rock-work and spring garden, and, when sufficiently abundant, may be tried amongst the other Anemones scattered about in half wild places. Flowers in April and May; vivid scarlet. Height, 1 foot. Propagated by division or by seeds.

Haller's Windflower (*Anemone Halleri*).—This at first sight closely resembles the Pasque-flower, but it is smaller, and the leaves are not nearly so finely divided. We have never seen it growing, but there is an excellent figure of it in "Loddige's Botanical Cabinet," t. 940, where it is described as having been found by Albert Haller in the St. Nicholas Valley of the upper Vallair, and it is said to be also found in Dauphine, Piedmont, and in the Eastern Pyrenees.

Common Hepatica (*Anemone Hepatica*).—To add perfume to the Violet, paint the Lily, or gild the yellow Crocus, would seem to be no more wasteful excess than to praise this exquisite little flower. There is a cheerfulness and a courage about it on warm sunny borders in spring which no other flowers possess; it is hardy everywhere, is not fastidious as to soil, though it loves a deep loam, and presents a charming diversity of colour. The principal varieties are



The Common Hepatica.

the single blue, double blue, single white, single red, double red, single pink (carnea), single mauve purple (Barlowi), crimson (splendens), and lilac (lilacina). Every variety of the common Hepatica is worthy of care and culture. Is it possible to imagine a more beautiful picture than we may produce by planting a mixed

edging of the various colours round say a bed of dwarf American plants, occupying space that perhaps would otherwise be naked? It is but one of many ways in which we may tastefully use them. The plant is a native of many hilly parts of Europe, usually found in half-shady positions, which will be found to suit it best in a cultivated state also. It is readily increased by division or by seeds, the double kinds by division only.

The Autumn Windflower (*Anemone japonica*).—This is one of the most stately and beautiful of all the species of Windflower with which we are acquainted, having a close-tufted habit, and its numerous flower-stems rise to an height of from 18 inches to 2 feet. The individual flowers often measure fully 2 inches across, and are of a



Anemone japonica.

clear rosy-purple colour. As an herbaceous plant, or for pot culture, this is one of the best of Anemones. A fine white-flowered variety of it is known as *A. japonica alba*, or *Honorine Jobert*, a kind even more



Anemone japonica alba.

beautiful than the rosy-flowered form. It is said to be a sport from *A. japonica* and not a hybrid as some have imagined.

The Narcissus-flowered Anemone (*Anemone narcissiflora*).—This belongs to a group which bears white flowers on umbellate scapes, and of which *A. rivularis*, *A. obtusiloba*, and *A. pennsylvanica*

may be cited as examples. It differs from all these, however, in having much more finely-divided leaves, and it is a kind which well deserves cultivation.

Wood Anemone (*Anemone nemorosa*).—This hardy plant, which not only embellishes the woods of these sea-girt isles in spring



The Narcissus-flowered Anemone.

The Wood Anemone.

but also those of nearly all Europe and Russian Asia, is so abundant in the British Isles that there is little need to plead for its culture. It grows, or will grow, in every wood or copse, dotting its handsome flowers all over the ground, should other things not interfere, and seeming to invite us to plant other beautiful species of *Anemone* by its side. It has been met with blooming sweetly on some of the very highest and most inaccessible crags of Helvellyn, just under some cliffs where a peregrine falcon had built her nest, and very far away from either wood or copse. There are double varieties, and the colour of the flower is occasionally lilac, or reddish, or purplish. A single sky-blue variety is in cultivation, which has flowered densely in a fully exposed position, and produced the most



The Blunt-lobed Windflower.

exquisite cushions of cerulean blue imaginable. One day it may become a popular rock-plant. Flowers from March to May; white, and reddish outside. Height, 6 inches.

Blunt-lobed Windflower (*Anemone obtusiloba*).—This is another beautiful Himalayan species, of dense tufted habit, having large three-lobed coarsely-serrate leaves and umbellate clusters of showy white flowers. It is well figured in the "Botanical Register," vol. 30, t. 65, and is said to be a native of the Choar Mountains, Himalayas, where it not unfrequently grows at an altitude of from 10,000 to 12,000 feet above the sea-level. It is well worth a place in sheltered portions in the rock-garden.

Cyclamen-leaved Anemone (*Anemone palmata*).—A very distinct kind, with leathery, kidney-shaped, slightly-lobed leaves and large handsome flowers, of a glossy golden-yellow, only opening to meet the sun. A native of North Africa, Spain, and other places on the shores of the Mediterranean; this charming flower requires and deserves a little more attention than most of its cultivated sisters. It is especially a rock-work gem, and should be planted thereon in deep turfy peat or light fibrous loam with leaf mould. It should not be placed in positions on the face of rocks suited for Saxifrages and many other plants that are content with mere crevices, and drape the face of the rocks with the slightest encouragement, but rather on level spots, where it could root deeply and spread into firm tufts.

Plants of very rapid growth or rambling habit should not be placed near it, as they might overrun and injure it. There is a double



The Cyclamen-leaved Anemone.

variety, *A. palmata* fl. pl., and a white one, *A. palmata alba*, both now rare. Flowers in May and June; 6 to 8 inches high, and is propagated by division or seeds.

The Spreading Windflower (*Anemone patens*).—This is a dwarf-growing species, tufted in habit, and one which bears creamy-white flowers fully 3 inches in diameter. Its leaves are finely divided, and the floral segments are hairy behind. It is rarely found in cultivation, although it is long since it was introduced. It is



The Spreading Windflower.

figured in the "Botanical Magazine," 45, t. 1,994, and is there said to have come from Siberia, and to have blossomed in Loddige's nursery at Hackney. In habit and mode of flowering it somewhat resembles the Pasque-flower (*A. pulsatilla*).

The Pennsylvanian Windflower (*A. pennsylvanica*).—This is showy kind, which well repays any little extra trouble that may be



The Pennsylvanian Windflower.

taken in cultivating it. Its leaf is like that of a *Ranunculus*, and the flowers themselves are something like those of a large white Buttercup. They often measure nearly an inch across, and are slightly tinted sometimes on the outside of the beautiful spherical buds. It grows about 18 inches high, and blooms freely for many weeks at a time. It is very valuable for cutting, especially for mingling with coloured flowers or green leaves, in a dish or basket.

Peacock Windflower (*Anemone Pavonina*).—This kind is very rarely seen in our gardens, though well worthy of being largely grown. The flowers are smaller than those of the common garden Anemone, but usually very double, from the great number of narrow pointed petals filling up the centre of each. These being of a gorgeous cinnamon-red, the effect is peculiarly rich when the flower opens well on fine days. Sometimes the central petals are green. The plant is a native of the south of Europe, should have a light warm well-drained soil, and is a charming ornament of the rock-work or border. In France I have seen it used with good effect as an edging plant for beds of spring and early summer flowers, but with us it is as yet too scarce to be employed thus. It is, however, rather abundantly grown in gardens in the south of France, and may be readily obtained by our nurserymen. Flowers in May and June; rich red. Height, 6 to 8 inches. Propagated by division at the end of summer or very early in spring. Mr. Niven says this species appears to degenerate from the beauty of the Continental



The Peacock Anemone.



The Pasque-flower.

type after a year's cultivation in our gardens—the petals assuming a greenish character, rendering the plant scarcely worth cultivating.

Pasque-flower (*Anemone Pulsatilla*).—Though sparsely distributed in Britain, this fine old border plant is a true native, and when it does occur on a bleak chalk down, it is generally freely dotted over the turf. The position is usually such as to suggest the aptness of the name Windflower for the family generally; and there are few sights more interesting to the lover of spring flowers than to



The Yellow Wood Anemone.



The Purple-anthered or Rill Windflower.

see its purple bloom just showing through the hard Grass of the blast-swept down on an early spring day. The plant is much smaller in a wild than in a cultivated state, usually devoting itself to the production of a solitary flower, which, while showing through the Grass, seems careful not to rise above it. In the garden it forms rich healthy tufts, and flowers more abundantly and vigorously, the contrasts between the wild and cultivated state of the plants being very marked. There are several varieties, including red, lilac, and white kinds, but these are now rare. There is also a double variety. It prefers well-drained and light, but deep, soil. Flowers in March, April, May; purplish. Height, 3 to 12 inches. Propagated by division or by seeds.

Yellow Wood Anemone (*Anemone ranunculoides*).—Not unlike the Apennine and the common Wood Anemone in habit, this species is so very distinct in its clear golden flowers that it is well

worthy of cultivation even by the side of the most admired kinds. Indeed, we may consider it an Apennine or a Wood Anemone done in gold! It is a South European species, and apparently is not so free on the generality of our soils as the blue Anemone, but when grown into well-established tufts on a light or warm and well-drained soil, it displays qualities of which those who have merely seen isolated plants or figures of the plant can have no idea. I have not found it do well on clay soil, but on chalky soil it seems to grow as freely as the common Crowfoot. It is quite charming for association with tufts of the Apennine or the Wood Anemone, the Pasque-flower, any of the varieties of *Anemone Hepatica*, the *Aubrietias*, and like plants. It comes in among the naturalised group of British plants, and grows in a semi-wild condition at Abbot's Langley in Herts., near Worksop in Notts., and it is also reported to occur in several other counties. It is one of the many beautiful hardy plants that may be freely naturalised in our woods and shrubberies. Flowers in the end of March and beginning of April. Height, 4 to 6 inches. Propagated readily by division, and also by seeds.

Purple-anthered or Rill Windflower (*Anemone rivularis*).—This is not unfrequently met with in good collections of hardy perennials. It bears star-like white-sepalled purple-anthered flowers on compound umbellate scapes. The leaves are sub-entire, and rather indistinctly fine lobed. The purple anthers and smooth purple peduncles serve to distinguish it from others of the distinct habited group to which it belongs. It is figured in the "Botanical Register," vol. 28, t. 8, and is said to be a native of the north of India. It is sometimes erroneously called *A. longiscapa* in gardens (Wallich's Catalogue, No. 4,691), but that species has reniform five-lobed leaves with shaggy foot-stalks and umbellate flowers, and is more nearly related to *A. narcissiflora*.

Starry Windflower (*Anemone stellata*).—This native of Southern Germany, France, Italy, and Greece, if not so showy, is



The Starry Windflower.



The Snowdrop Windflower.

quite as beautiful as the common garden Anemone. The star-like flowers—ruby, rosy-purple, rosy, or whitish—springing from the much-dissected leaves, vary in a very charming way, and usually have a large white eye at the base, which contrasts agreeably with the gay or delicate coloration of the rest of the petals, and with the rich brownish-violet of the stamens and styles that occupy the centre of the flower. It is not so vigorous in constitution as the Poppy Anemone, and requires a little more care than that does; but this will only make it the more interesting to all who love variety in their collections of hardy plants. It likes a sheltered yet warm position, a light, sandy, well-drained soil, and seems to make little or no progress on heavy clay soils. It is suitable for association with the choicer kinds of Anemone on the rock-work, the mixed border, and the choice spring garden, and should be grown in every garden where spring flowers are appreciated. Flowers in May; height, 10 inches. Propagated by division or by seeds.

Snowdrop Windflower (*Anemone sylvestris*).—A free-growing and handsome species, partaking somewhat of the size and vigour of the Alpine or Japanese Anemone, and the neatness of habit and densely-blooming qualities of the dwarfed kinds. It grows vigorously on almost any soil; the handsome, pure white flowers, as large as a crown piece, being freely produced over a mass of fresh green leaves. A native of Siberia, North Italy, Germany, and France, it is perfectly at home in this country, should be grown wherever first-rate border flowers are appreciated, will associate well with the Alpine Windflower, and plants of like size, about the lower and flatter parts of the rock-work, and, being naturally a native of the grove, will be found perfectly at home along our wood walks and half-wild spots, in

shrubberies, &c. The aspect of the drooping unopened buds has suggested its English name—the Snowdrop Anemone. Flowers in April and May; pure white. Height, 1 foot to 15 inches. Propagated readily by division of root.

Three-leaved Wood Anemone (*Anemone trifolia*).—This is an interesting little species, much like the Wood Anemone, but not so widely distributed. Although found in a wild state in pleasant



The Shaggy Pasque-flower.



The Rue Anemone.

groves on the woody hillsides of Piedmont or the Tyrol, it does perfectly well in our climate, and should be grown everywhere for variety's sake. It may be readily known from its relative, the Wood Anemone, by its neatly toothed trifoliate leaves, and it seems to be a little smaller and dwarfer in habit. I have, however, never seen them under exactly like conditions. It is well suited for naturalisation along with *A. apennina* and others of the family, and is, of course, suitable for rock-work or borders. Flowers in April and May; white. Height, 4 to 6 inches. Propagated by division and by seeds. We could not succeed in getting a living specimen of this for illustration near London.

Shaggy Pasque-flower (*Anemone vernalis*).—One of the Pasque-flower division of the Anemone family, but very dwarf. The flowers are very large and shaggy, and covered with brownish silky hairs. It is a rare plant, and should be grown in some select spot on the rock-work, giving it good drainage and deep soil. A native of Norway, Sweden, and extreme northern countries, and also of very elevated positions on the Alps and Pyrenees, and is rarely seen in good condition in our gardens. It should, as a rule, be grown on a level spot on rock-work, in deep free soil, and be abundantly supplied with water in summer. Flowers early in spring; whitish inside. Height, 4 to 8 inches. Propagated by division and by seeds.

Rue Anemone (*Anemone thalictroides*).—This is more correctly a *Thalictrum* than an Anemone, but the flowers are very like miniature Anemones. It is a delicate, diminutive, and interesting species, with the "habit and frondescence of *Isopyrum*, the inflorescence of



The Vine-leaved Anemone.

Anemone, and the fruit of *Thalictrum*." These qualities, in addition to its dwarf habit, usually only a few inches high, make it worthy of cultivation. The flowers are white, nearly an inch in diameter, open in April and May, the flower-stems bearing a few leaves near the summit, so as to form a sort of whorl round the flowers. It is a native

of many parts of North America, and is increased by seed or by the division of its tuberous roots. There is a pretty double variety, with the flowers somewhat smaller than those of the single one, and very neat. Being small and fragile in its parts, it requires a little more care than most of its brethren, should have a light, peaty, and moist soil, and be associated with other delicate growers, or placed in a position where it is not liable to be overrun by coarse neighbours.

The Vine-leaved Anemone (*Anemone vitifolia*).—As regards mode of growth and flowering, this closely resembles the Japanese Anemone, before alluded to, but is much more downy, and it flowers a fortnight earlier than *A. japonica*. We have seen it flowering in the herbaceous ground at Kew, and consider it well worth cultivation. It is a native of the moist shady valleys of Nepaul, where it is said to be one of the commonest and most beautiful of all wild flowers.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Sowing Late Peas.—Peas for late use should now be sown; except in favourable situations, these late sowings are very liable to be affected by mildew, but much may be done to prevent or mitigate the evil. There are several causes that tend to develop this parasite—a want of water, sowing too thickly, and an insufficiency of air; and, if the land is poor, the evil is thus aggravated. For these late crops the most open position in the garden should be chosen, and if the rows are at long distances—say a dozen yards apart—with the intervals occupied by some low-growing crop, a better chance will be afforded them of being benefited by the wind, which is unfavourable to mildew. The ground should be well and deeply manured, so that the roots may have plenty to sustain them through intervals of dry weather; they should also be sown very thinly. By attending to these matters, and never allowing them to want water, which should be so applied as to moisten the soil as far as the roots extend, Peas may be had late; when, with some, they are held as much in estimation as the earliest crops. For the latest crops many advise the small early sorts to be sown, but these are often not satisfactory, as they produce little, and often come in prematurely. Any approved tall kind, such as Emperor of the Marrows or Ne Plus Ultra, will be found to succeed the best.

Vegetable Marrows.—If the weather be warm, these may now be put out in the open ground. See that the plants are thoroughly prepared by gradual hardening in a cold frame, with plenty of air previously, or they will be some time before they make any progress. If hand-lights can be placed over them for a fortnight it will much accelerate their growth, tilting them at the opposite side from which the wind blows in the day-time, and closing down at night. The ground should be made very rich for quick rank-growing plants of this description.

Planting Cauliflowers, Cabbages, &c.—The earliest sown Cauliflowers and Cabbages will shortly be large enough for planting out. These, like most other things, are much better placed where they are to be grown whilst young, instead of being allowed to remain too long in the seed-bed. If the soil in which they are planted is at all dry, give a good soaking before taking them up, by which means they will lift with plenty of roots, and receive proportionately little check. Thin all advancing crops as soon as they require it, and make successional sowings of Spinach, Lettuce, Radishes, and small salad.

Peaches and Nectarines on Open Walls.—Where moveable coping-boards are used these should now be taken down. Examine the trees carefully for greenfly, and on the first appearance of curled leaves immediately wash with tobacco-water, or dust with Pooley's powder; washing is the most effectual means of getting at the insects when rolled up in the leaves; but, whatever method is employed, it should be thoroughly carried out, so as not to require repeating; these insects are later than usual in making their appearance this year. In most places large quantities of fruit have set. Thin at once, but do not at the first operation remove all that can be dispensed with. Amateurs who have not had experience in the cultivation of these fruits are liable to make mistakes in not always leaving those that are best placed for after growth. In seasons like the present, when such an abundance of fruit has set, there need be little difficulty in this matter. All the fruit that is at the off side of the branches, that is, on the side next the walls, should be taken off, as here it obviously cannot have room to swell, unless by loosening the shoots, which is unnecessary when there are plenty at the front. At the time of thinning remove a portion of the superabundant shoots, but let this be done gradually, not stripping the trees of too much leaf at a time, as this has a most injurious effect upon their future strength. Go over the whole with the garden engine or syringe twice a week, giving a good washing with clean water; this will not only prevent

further appearance of Aphides, but will keep in check red spider and thrips; the presence of these is fatal to healthy foliage, without which the fruit can never be equal in size and quality to what it ought to be. There is nothing the amateur cultivates that will better repay attention than these fruits.

Flower Garden, Shrubbery, &c.—*Alternantheras*, *Coleus*, and *Iresines* should now be prepared for planting out in the course of another week. Give them plenty of air and light, and extend this treatment to all tender plants of a sub-tropical nature. See that none of the latter suffer for want of water, as, if their pots are very full of roots, they will require constant attention in this matter; if allowed to become dry, the bottom leaves of soft-growing plants will lose colour—a condition that renders them unsightly through the season. Where carpet-bedding is carried out, all the plants used, except those tender ones named above, should be put in the places they are to occupy, filling the others in afterwards. On all dressed ground, such as herbaceous borders and amongst shrubs, the use of the hoe and rake must be kept up, so that the whole may have a tidy appearance. During the present growing weather, the mowing-machine must be in frequent use, for, if the Grass is allowed to get too long, not only is it objectionable in appearance, but more labour is entailed. Thin out early-sown annuals; the real merits of many beautiful specimens are rarely seen through being often sown in out-of-the-way places, under the drip, shade, and impoverishing influence of the roots of deciduous trees. If, perchance, they happen to get an open situation, where they might have a chance of showing their true character, they are too often allowed only a fourth of the room they require. Let every species and variety have enough room to grow to its full natural size, by which means the flowers will individually be much larger, and the duration of the plants flowering will be considerably extended. Roses should now be mulched with 3 inches of good rotten manure from last year's hotbeds; this, if broken small with the fork, will be less unsightly than that which is not as much decomposed. Mulching under any circumstances does not improve the appearance of the ground's surface, but unless in the very best Rose soils it is a necessity, where the full quantity of well-developed flowers is required; it also assists the perpetual flowering varieties to throw up a succession of bloom. Roses of all descriptions, on their own roots, as well as the different stocks used, are all surface rooters, and when the weather is hot and dry, are, unless mulched, sure to suffer. The cold backward spring we have experienced has had the effect of keeping insects in check; in most places the Rose maggot and aphides have been much later than usual in making their appearance. For the maggot there is no remedy but crushing them with the fingers. This is not nearly so tedious an operation as might be supposed by those who have not had any experience in Rose culture. The insect is easily detected, for, wherever there is a rolled-up leaf it is certain evidence that the grub is present; a very slight pressure will destroy them. Amateurs will find it best to go over their plants once a week (for, wherever the caterpillar exists in quantity, few perfect flowers will open), at the same time dipping the points of the shoots affected with aphides in tobacco-water. A good washing with clean water, applied by the syringe or garden-engine twice a week, will help to keep them free from insects, and also refresh the plants.

Houses.—*Pelargoniums*—show and fancy varieties—will now be fast pushing up their flowers and will be assisted by clear manure-water. For home decoration, it is neither necessary or advisable to tie them out so regularly as when they are intended for exhibition; use only sufficient sticks and ties to support the plants and prevent them having an untidy appearance. For summer and autumn decoration nothing is more useful for amateurs' green-houses than the zonal varieties of *Pelargoniums*; keep these near the glass, so as to induce stout short growth, and do not allow them to become exhausted with flowering at the present time, as they will be much more useful after the show and fancy sorts are over. Pot on young plants of *Balsams*, giving them soil well enriched with a good sprinkling of sand and one-fifth of leaf mould, in which all quick-growing plants of this description root freely. Late herbaceous *Calceolarias* will now be coming into bloom. See that these are free from aphides, or every flower will be crippled. These are gross feeding plants, and delight in manure-water, bearing it stronger than many things. The old but beautiful blue-flowered *Plumbago capensis* should be grown by all amateurs. It is a plant easily managed, and, when in bloom, well bears removal to a dwelling house, where it continues in flower for some time. It is most useful grown in small pots of a 6 or 8-inch size. It will thrive in any soil—loam or peat—sufficiently porous. *Kalosanthes*, which are easily grown and excellent decorative plants, will now require sticks and ties to support their heavy heads of flower that are fast coming to maturity. They are subject to aphides, which get into the points of the shoots and completely spoil the flowers, but are

not easily detected in these plants, except by the yellow hue they give to the leaves; dip in tobacco-water, or smoke any that may be affected. Azaleas will be actively making growth; keep them well syringed, and let the atmosphere be a little closer; a spare pit, if at command, would suit them. If any require potting, give them a shift; these plants are best re-potted when the young shoots have made considerable progress, as, until then, the roots do not begin to move. Do not disturb the roots in potting more than is necessary, and shade from the sun for a fortnight afterwards, keeping the atmosphere moist and close. Amateurs who have not had much experience in Grape growing will generally leave the berries too much crowded in the bunches the first time they are gone over in thinning; as soon as this is seen to be the case more should be taken out without delay, for, if allowed to remain until they get large, they are more difficult to remove, and needlessly waste the strength of the Vines. It is generally from the point of the bunches about midway up that the berries are most pinched for room. Underthinning is a bad practice, each berry being smaller than it otherwise would be if the number in each bunch was sufficiently reduced. Continue to treat, as regards moisture, air, and closing, as advised a few weeks back. When the amateur's greenhouse has Vines over the plants, if kept cool through the winter and allowed to break by the sun's heat, they will by this time have set their fruit and require thinning. All the plants for which room can be found in pits or frames should be removed from under them, so that, as far as possible, each may receive the treatment they require. The greater portion of the plants do not like the shade of the Vines, or the early closing whilst the sun is upon the glass, which is necessary for the Vines, both as a means of bringing on the present crop and ripening the wood for another season. Syringe at the time of closing the house.

Flower Garden and Pleasure Ground.

The removal of spring-flowering plants from the flower beds, in order to give place to summer bedding plants, affords a good opportunity for increasing the former by dividing the old plants, and setting the divisions in suitable situations in the reserve garden, where they should be carefully attended to with water until they have become established; there they should be allowed to remain during the summer months, after which they will be ready to again take their places in the flower beds when the summer bedders have been removed. This applies to all such plants as Aubrieties, Forget-me-nots, Daisies, Polyanthuses, Primroses, &c. Cuttings of double Wallflowers, and similar plants, should now be inserted under hand-glasses; and these, when well-rooted, should also be planted out in the reserve garden. Seed may also be sown now, if it has not already been done, of the various single flowering varieties of this plant. The putting out of summer bedding plants should now be proceeded with as rapidly as possible. It is not by any means necessary that such plants as Verbenas, Lobelias, Golden Feather Pyrethrum, Iresines, Coleuses, Alternantheras, &c., should have been potted off singly, indeed they are generally found to succeed equally well, or, even better, when they are shaken from the store or cutting pots, and planted in the beds at once, or, rather, pricked into the soil with a small dibber, and well watered as the work proceeds. This watering should likewise be repeated every evening, should the weather be dry, until they are fairly established in the beds. Standard Pelargoniums, Fuchsias, Cytisuses, Abutilons, Dracænas, Palms, &c., should all, if necessary, be securely staked as soon as planted, in order to prevent them from being injured by high winds. There are few hardy annual flowers which can be recommended to be associated with the Pelargonium and other bedding plants in the flower garden, chiefly on account of the short time during which some of the most beautiful amongst them remain in bloom. This objection does not as a matter of course apply to such plants as the Amaranthus, Perilla, and a few similar plants, which are grown on account of their ornamental foliage. Many hardy annual flowers, however, are very beautiful, and furnish shades of colour which have not yet been found amongst bedding plants. They are also very useful as marginal plants to shrubbery borders; while, in suitable situations, beds of the various kinds of Asters, and the beautiful varieties of Sweet-scented Stocks, are very effective and interesting, and ought to find a place in every garden. Many of the improved varieties of Phlox Drummondii, too, are exceedingly beautiful, and they, at least, may be used as bedding plants, and have a place assigned to them in the flower garden, as they generally remain in perfection throughout the season. The wintering of the vast numbers of bedding plants which are necessary for properly furnishing the flower beds is found to be a very severe tax upon many garden establishments, more particularly where there is anything like a paucity of glass structures; and the question has been frequently asked if a flower garden could be kept gay

during the entire season or summer months by the use of annual flowers alone. This may certainly to some extent be done, providing a judicious selection of varieties is made in the first instance, and they are afterwards properly managed. For although some of the most beautiful varieties, such as the *Nemophila*, are of short duration, they could nevertheless be succeeded by others which might be had in readiness in the reserve garden, and transferred into the flower garden during showery weather, with comparatively little check. Many others, too, with proper attention would be found to be sufficiently enduring to continue in health and beauty throughout the summer, such, for example, as the *Phloxes* already mentioned, the *Dianthus Heddwigi* and its numerous varieties, several kinds of Stocks, Asters, *Mignonette*, the *Blue Lobelia* (which may be treated as an annual), and many others. The raising of many of these may be accomplished by sowing the seed in a sheltered and suitable situation in the open air during the month of April. Although this would necessarily be attended with considerable delay; but with the aid of a frame or two, and a slight hot-bed, most of the plants just named could be had ready to plant in the beds by the middle of May. And all this could be done at less than a tithe of the trouble and expense which bedding-plants incur. Hardy Ferneries, or rock-gardens, should now have every necessary attention; such as the removal of decayed fronds and weeds, the loosening of the soil, making up of any deficiencies which may have taken place, and the introducing of new, rare, or delicate varieties which it may be found advisable to keep under glass during winter. Evergreen shrubs may yet, if found necessary, be transplanted; and the growth of others may be regulated and cut back, so as to prevent strong-growing sorts from taking possession of space required by more delicate or slower-growing species.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Indoor Fruit Department.

Vines.—As each Vine in the early houses is cleared of its crop the foliage should be thoroughly syringed with clean water, so that any insects that might hinder the ripening of the wood may be washed off. Those parts badly infested with red spider or thrips must be syringed two or three nights in succession, and a thorough drenching with the garden engine or some equally strong power once a-week will greatly help to preserve the foliage, which should be kept as long as possible in a healthy state. Where it is not necessary to close the ventilators for the benefit of tender plants full air may be left on all night in all Vineries after the fruit is cut. Any straggling lateral growths which may have been allowed to grow while the fruit was ripening should be cut in to the part whence it started, so that the buds upon which dependence is placed for next year's crop may have every chance of becoming matured. It is a great advantage at all times, more especially in the case of early forcing, to have the wood completely ripened; and now that the nights are getting milder, air, in small quantities, may be admitted continuously in all Vineries in which Grapes are swelling; this supplies the interior of the house with fresh air, which is more conducive to the free and perfect development of the fruit than a close atmosphere. As soon as syringing is discontinued, to admit of the fruit colouring, the flow pipes may be painted over with sulphur. It is a waste of fuel to light Vinery fires on fine mornings; a little artificial heat in the evening is generally sufficient to keep up the temperature, and a liberal quantity of air should always be admitted in the morning to prevent the temperature from rising too high and scorching the foliage, which is liable to occur.

Pines.—The principal work in Pineries at present consists in airing and damping. On very hot days the pathways should never be allowed to become dry, for an arid atmosphere is not beneficial to many Pines, at whatever stage of growth they may be. Where the plunging material is dry, it should be thoroughly saturated with water. Still shut up early in the afternoons, and a little air should be admitted throughout the night, putting it on at about six o'clock in the evening and gradually increasing it from six o'clock next morning, as it becomes necessary. Keep plants showing fruit successively to the Queens well supplied with water at the root.—J. MUIR.

Hardy Fruit.

The splendid weather of the past three or four weeks has, in a large measure, made up for lost time; and the season, which at one time seemed to be a month later than usual, will now be as early as the average. I do not ever remember such rapid growth as was made recently by all kinds of fruit; the promise of large crops of all sorts is still all that could possibly be desired; and if—as we may now reasonably hope—we escape injury from spring frosts, the labour of thinning the fruit will not be small. Apricots, if not already thinned, should be paid attention to; then Pears and Peaches. The two latter have set their fruit so thickly that delay in doing this will be most injurious to the future welfare of the trees.

Do not yet wholly remove the spray or breastwood from Pears and Plums, but allow it to remain as a screen till the critical period of the 20th to the end of the month is past. Aphides have appeared in large numbers, especially on Cherries and Plums. Peaches, which are usually most subject to their attacks, are, as yet, comparatively clean—a circumstance which is due, no doubt, to the copious washings they have had with the garden engine. This is the best of all remedies, and should be brought into use upon all affected trees. Currants and Gooseberries are at present free from blight, but it is more than likely that caterpillars may attack the latter before the end of the month is out. On their first appearance hand picking, which is always the best and surest remedy, should be resorted to. In many cases grafts put on at the beginning of last month will now be sufficiently advanced to have the clay removed and the ligatures loosened and re-tied somewhat slacker to allow for the expansion of growth. The stocks should have all shoots rubbed off as produced, and the grafts trained into the form desired. Water should be freely given to all recently-planted trees, and Strawberry plantations will be much benefited by repeated waterings from the time the fruit is set to its ripening. I know no other kind of fruit that suffers so much or so soon from drought, or that gives better returns for generous treatment than Strawberries. A piece of ground should now be prepared by trenching deeply and manuring heavily for the purpose of planting out the forced plants; the rows should be 30 inches apart and the plants 24 inches from one another. Previous to planting see that the balls are thoroughly soaked; take out the crocks and, with a pointed stick, slightly loosen the matted roots that they may the more readily take hold of the soil. From such plantations the best crops of fruit will be had next year. Strawberries ought never to occupy the same ground more than two seasons in succession, if quality is desired.—W. WILDSMITH, *Heckfield*.

THE LIBRARY.

THE FERN PARADISE.*

THIS book, the plan of which, we are told, was originally embodied, upwards of a year ago, in three magazine articles, has for its acknowledged object the development of the popular taste for Ferns “in such a way as to lead to the more extensive cultivation of these beautiful plants, not only in our gardens but in our dwelling-houses.” If an enthusiastic appreciation of his subject, a vivid imagination, and splendid powers of description are likely to assist in the accomplishment of the author’s purpose, Mr. Heath will probably have the satisfaction of knowing, in time, that he has been successful; and although we cannot altogether support the claim that is put forward of his having been the originator of the idea of Fern culture in town gardens or in town windows, he is at least extremely likely to aid, to a very wide extent, its full development. His work has evidently been a labour of love; and, wisely choosing to approach his subject from an æsthetic rather than from a scientific point, the opportunity has been afforded of descriptive writing of a nature rarely to be found in works bearing upon botanical matters, which are too often the vehicles for the exhibition of the author’s learning, whilst the more attractive features of the subject are, in a great measure, overlooked. Mr. Heath has divided his book into two distinct parts; the first he devotes to glowing descriptions of the paradise in which the Fern revels when growing in the copses, hedge-rows, valleys, and moorlands of Devonshire; the second relates to the various kinds of Ferns and their culture. In this latter portion enough practical instruction is conveyed to enable anyone who has been laid captive by the charming “word painting” of the earlier chapters of the work, and who has the least possible space, to undertake, with fair hopes of success, the care of these lovely forms of vegetable life. We wish the author every success, and, in order to give some idea of his manner in dealing with his subject, extract the following:

About a mile from the town our road commences to skirt one side of the Dartington Wood on the right. The sun is shining brightly, but at this spot arching trees on each side of us envelope the path in dark shadows. A little distance further on, we reach a point in the road where a rushing stream comes out of and flows for some distance by the side of the wood. The scenery at this spot is beautiful almost beyond description. All who admire sylvan loveliness should visit it.

* “The Fern Paradise,” By G. Heath. London: Hodder & Stoughton.

A rude rustic bridge crosses the stream and gives access to a narrow, steep, and winding path which leads up into the dusky recesses of the wood. When we travelled the route we are describing, it was May. On the right of the rustic bridge, and almost overshadowing it, a large Hawthorn bush was white with blossom, and scented the air all around with its delicious fragrance. Below us the stream was rapidly eddying, waving the weeds and wild growth that sprung up from its bed. Just in front, a sudden fall in the level of the stream caused the gurgle and foamy splash of a tiny waterfall. A sloping bank led down on the right from the road to the water’s surface, covered—in such splendid luxuriance as is everywhere to be seen in Devonshire—with tall, rich, delightful green Grass intermingled with the dark green fronds of the Hart’s-tongue, and the handsome shuttlecock-shaped fronds of noble specimens of the Male Fern. The left banks of the brook hung far over the water, the bushes, Ivy, and Moss-covered branches of trees which crowned them affording cool, dark, and moist nooks for the Ferns, whose exquisite fronds, dropping gracefully over the stream in splendid clusters, lapped it with their beautiful tips. Beyond the bridge the stream flows for a short distance under the dark shadows of the wood, winding, falling, splashing, and foaming as it hurries along out of sight. The peep in this direction is delightful. Trees above—Moss-covered, Ivy-covered branches; some gnarled, and others fresh and vigorous; trees on each side, all densely clothed with their fresh and glorious May dress. The clear brook reflects the shadows of trees and shrubs, and becomes dimly seen as it disappears under the dark vista of the wood. This vista, formed of the delightfully intermingled branches of the trees overhead, presents the most charming peep. The matted branches, green limbs and twigs, would fairly exclude the light, were it not that at the darkest and densest part of the canopy slight openings afford a view of the sky, and whilst they admit the softened sun-rays, give the prospect of a beautiful wood-crowned hill, rising upwards beyond the delightful canopy, which hangs so gracefully over the clear and glancing waters of the brook. For some little distance the stream runs by the side of the road we are following, until, when the latter takes a sudden turn to the right, it disappears under a stone bridge, re-appearing for a brief space, and then being finally lost as it flows away across the meadows. Peer over the side of the bridge and you will find little tufts of that beautiful Fern, the common Maiden-hair Spleenwort; also the tiny Wall Rue, and small specimens of the Hart’s-tongue. You will rarely find a Devonshire bridge, unless it be quite a new structure, without its complement of Ferns—the rock, or stone-and-mortar-loving species. Whether it be a river bridge, or a tiny arch that crosses a brook, its sides are almost certain to possess at least one kind, often many, of the moisture-loving plants. No doubt it is the moist atmosphere produced by the flowing water underneath which gives encouragement to the Ferns. Sometimes a river arch is densely covered with many varieties of Ferns. You will often find the Polypody, the Hart’s-tongue, the Wall Rue, the Scaly Spleenwort, the common Maiden-hair Spleenwort, the Black Maiden-hair Spleenwort, growing together on bridge sides. But the specimens of Hart’s-tongue are invariably diminutive when growing on walls, rocks, or bridge arches. The Black Maiden-hair Spleenwort, unquestionably one of the most beautiful of the Fern family, is also usually found to be stunted when growing on the bare open side of a rock, wall, or bridge arch. It nevertheless delights in stones; but then the stones and rocks must be in the shade, and covered by overhanging bushes. A little way from the stone bridge already mentioned, on the road between Totnes and Ashburton, in the slate rock side of a hedge-bank, we caught sight of a tuft of the Black Maiden-hair, growing in a conspicuous position. We felt persuaded that other specimens would be near. One portion of the slate rock was hid by bushes that closed over it. Pressing these on one side, we found as we had expected an unusually fine plant of our Spleenwort, its roots being firmly embedded in the layers of slate rock, which were kept cool and moist by the shelter of the bushes. Where this Fern is to be found, you will always find the largest and most luxuriant specimens in the darkest and dampest corners. No Fern shuns the light more than the graceful and beautiful *Asplenium adiantum nigrum*. It is a great favourite of ours, and cannot, we think, fail to be admired by all Fern lovers. It is hardy, too, and will well repay in cultivation a very small amount of care and attention. It is astonishing how many delightful green lanes abut on to the high roads in Devonshire; lanes so temptingly beautiful that you feel you cannot pass without exploring them for, at least, some little distance. We espied such a lane when, on the road we are describing, we reached the top of the hill, on the other side of which lay Staverton Bridge. This lane turns out of the road on the right, and we explored it for a short distance. A few yards from the entrance, a bend in the lane hid its further course from view. But the peep just where it disappeared was charming.

THE PUBLIC PARKS AND GARDENS OF BRUSSELS.

AMONG European capitals of the second rank the pleasant city of Brussels stands pre-eminent. The lower town, with its Grande Place; the Hôtel de Ville, with its matchless spire; the many specimens of quaint mediæval architecture and the curious old fountains in its ancient streets, present many attractions to tourists; while the upper and more modern city, which contains the cathedral dedicated to St. Gudule, is remarkable for its Place Royale and Rue Royale, erected in a bold and striking style of architecture, dating from the first half of the eighteenth century—a style which has an artistic physiognomy of its own, and which is distinguished throughout the low countries as the “style de Bruxelles.” The “Park,” as it is termed, was created about the same period, and in its style and arrangement bears a strong resemblance, on a small scale, both to Versailles and the Tuileries. It is laid out on a generally geometrical plan, but portions have been left to a certain extent wild, with untrained timber trees, in a somewhat similar manner to the northern side of Kensington Gardens,

round which is a broad circular walk. One of these shallow basins is a dry one, floored with turf; the other contains a handsome fountain, and the water teems with gold and silver fish. The vista is closed to the north (beyond the boundaries of the park), by the handsome building containing the Chambers of Peers and Deputies, and to the south by the Royal Palace, which has recently been rebuilt in a somewhat sumptuous fashion. This charming little “park”—for, in spite of certain topiary formalities, it is exceedingly attractive—is not much larger than Lincoln’s-inn Fields, and yet it has its casino, and its theatre, both partially concealed among the trees of the northern extremity;—showing how very much more might be done with the open spaces in and about London than is at present attempted, or even dreamed of. While making this remark, it is by no means intended to recommend that more should be attempted than the space at command legitimately admits of, as has certainly been the case with Leicester Square, which is, nevertheless, an advance in the right direction. Brussels possesses a second park, of very distinct character,



View in the Public Park at Brussels.

the plantations of which were laid out about the same time. Two of the untrimmed portions of this graceful little “park” form deep valleys, in which deer were formerly kept; and fifty years ago nightingales visited these shelters in early spring, their lavish carollings being heard as far as the Place Royale and even in the Montagne de la Cœur. In those days the ancient fortifications still existed, the high ramparts having only one row of houses between them and the park, and beyond the walls was open country as far as the great forest of Soignies, the massive foliage of which, skirting the horizon for many leagues, was visible from the eastern ramparts. The demolition of the fortifications, and the creation of vast new streets and suburbs in that direction, has driven the nightingales as well as the picturesque hoopoe and the golden auriole away from the “park.” Our engraving represents the main avenue of the park, bordered with statuary, some of which are of a superior character. The line of this principal walk is interrupted and pleasingly varied by two handsome shallow basins, surrounded by a fine marble coping,

at a distance of some three or four miles from the heart of the city, beyond the Namur suburb. This is the wood of La Cambre, the Bois de Boulogne of modern Brussels. Immediately after the levelling of the old ramparts, long lines of houses of a superior character sprang into existence with such rapidity, along the principal roads, that the first portion of the forest-land, by the Chaussée de Namur, was reached by the builders in an incredibly short space of time; and the first outlying strip of forest, the Bois de la Cambre, would inevitably have been laid low, and bricks and mortar have taken possession of its groves and slopes, to convert them into prosaic streets, had not the Government stepped in, and secured it for the State. It is a very picturesque piece of wild woodland; and care has been taken, in converting it into a promenade for the recreation of the citizens of Brussels, to preserve its wild character as completely as possible. In spring its steep slopes are covered with early wild flowers, and the nightingales and other song birds fill the old trees with a cheery concert each morning and

evening. It is a favourite Sunday promenade; and, indeed, hundreds of carriages may be seen rolling gaily along the Chaussée de Namur almost every fine afternoon for drives in the Bois; the ancient promenade, the celebrated Allée verte, along the side of the great canal, near the Porte de Laeken, having been partially destroyed in consequence of important improvements and alterations. The only feature which art has added to the Bois de la Cambre is a very grand archway, formed of characteristically executed rock-work, of fine naturalistic aspect. It serves as a viaduct for the completion of a carriage road round the outer limit of the wood, and has a very fine effect. A footway passes underneath it in the direction of one of the entrances. Brussels possesses two other promenades; one, the new botanic gardens, occupying a portion of the ancient fosse of the fortifications, and the other the zoological gardens, which last is important, both on account of its dimensions, and also on account of the skilful manner in which it has been laid out so as to combine landscape effects with the exhibition of animals—large spaces being allotted to some kinds, such as deer and antelopes, rare species of exotic cattle, aquatic birds, &c., which there appear almost as though seen in their natural state. The space being, or appearing much more extensive than that of the Zoological Gardens in the Regent's Park, spacious and picturesque arrangements of the kind referred to have been much more easily devised. Many of the points of view in these gardens are extremely beautiful; and, in the planting, many new or rare trees have been selected, which impart a greater freshness of aspect to the scene than if the old familiar kinds, however beautiful, had been alone resorted to. The refreshment rooms form a spacious building of handsome elevation, and are much resorted to in summer for dinner parties, suitable accommodation for which being very complete. In the attached pleasure garden are large kiosks, in which good music may be heard on most summer afternoons; in the evening they are often let to different choral societies, and, when illuminated on such occasions, these extensive zoological and pleasure gardens form a pleasant lounge, which can scarcely be surpassed by any public garden in Europe.

Change of Climate in Scotland.—Mr. Buchan lately read a paper before the Edinburgh Botanical Society on the "Bearing of Meteorological Records on supposed Change of Climate in Scotland." He referred to the deep-rooted opinion generally entertained that the climate of this country has changed, and then showed a number of meteorological charts prepared from observations taken at Gordon Castle, Edinburgh, Dollar, and Dunfermline, extending from 1780 to 1870, which proved that during this period there had been no permanent alteration of climate. His general conclusion was that, while there were fluctuations from year to year in the temperature of particular months, there was no such general falling off in summer heat or diminution of winter cold, as had been suggested by Mr. M'Nab, to account for certain phenomena of vegetation. Taking December, he found twelve years, commencing from 1782, in which that month was above the average of temperature; then twenty years, in which it was greatly below the average; then nearly a quarter of a century, in which it did not come down to the average; then fifteen years, in which it was generally under the average; then five years, in which it was above the average; then the last five or six years, in which it had been a cold month. Similar fluctuations were observable in January and November. Taking July again, he began with a warm period; then there was a cold period of nearly the same extent as the December cold period, but not so pronounced; then a period slightly above the average; then one below the average, and so on—the last six years having had warm Julys. There was here, then, the same fluctuation, but no permanent reductions of heat. As a statistician, he should say that before any positive opinion could be pronounced as to a permanent change having passed on our climate, they must have the averages of at least a thousand years. Mr. Buchan went on to suggest that while there might be no excess or defect of temperature on an average, in recent years as compared with the past, alterations might occur with greater frequency and intensity, and occasion an amount of mischief which was not due to general defect. He quoted figures showing the number of times that certain stages were reached in different periods; and in conclusion, submitted that the prevalence of intense cold or heat was quite local, and that when there was great cold in one place, there was great heat contiguous to it.

THE FRUIT GARDEN.

GOOD VARIETIES OF PEACHES.

Tullins, or Syrian Peach, also called Michal's Peach *Pêche de Tullins, Pêche Michal, or Pêche de Syrie* (French).—This little-known variety is among the fruits recommended by the French Pomological Congress, and it is also included in the list given by Messrs. Decaisne and Naudin in the fourth volume of their "*Manuel de l'Amateur des Jardins*." Mr. Chatin speaks of it in the "*Journal de la Société Centrale d'Horticulture de France*," as a handsome and good free-stone variety, which thrives well as a standard on the hills along the valley of the Isère; but in the climate of Paris it must be grown as an espalier, or against a wall. It has borne the third year from seed. The introduction into France of this excellent Peach is due to Commander Barral, who brought a small bag of the stones with him on his return from Egypt, and presented them to Dr. Michal, of Tullings, as being more precious than a bag of gold. Until within the last few years its cultivation was almost limited to the commune of Tullings.

Alexis Lepere.—This variety was first submitted to the Comité d'Arboriculture for their judgment in 1871; and each year since it has been again presented for further test. It is of good size, and the colouring is very attractive and beautiful. The flesh is of fine grain, melting, juicy, sugary, and agreeably perfumed; thus uniting all the qualities requisite to entitle it to the qualification of excellent. It was raised from seed by Mr. Alexis Lepère, junior, in Germany, who has dedicated it to his father. The stock has been entrusted to Mr. Columbier, nurseryman at Vitry, who will send it out.

Salway.—This Peach, which is now very little grown in this country, has the name of being the best late variety, or rather the latest of good varieties, on the Continent. What, however, is far more strange, it is quoted among the novelties in fruit trees. It is recommended not alone for its lateness, but also for its flavour, which is probably heightened by a Continental autumn.

Early Beatrice.—This, and some other varieties raised by Mr. Rivers, are making their way on the Continent, and are favourably mentioned by French pomologists. Well ripened fruit of a good colour of this variety was exhibited before the Central Horticultural Society of France, on the 9th of July last year, by Mr. Chevalier, of Montreuil, and the Fruit Committee recommended it for trial. This variety appears to have a brilliant future before it.

Early Rivers.—This also was submitted to the same Society, by Mr. Jamin, on the 23rd of July, and was likewise approved.

It is gratifying to find that our only raiser of note has been so successful, and the opinions of Continental growers will have some weight with British gardeners.

H.

SHADING PINES.

YOUR correspondent, Mr. Barnes, comes down with a sweeping condemnation of this practice; but, although I do not, as a rule, advocate it, yet in some cases, and under certain circumstances, it may be desirable and even necessary. Much depends on the kind of structure Pines are grown in, whether lean-to, or span, or constructed of iron or wood. It may be that Mr. Barnes has had more to do with lean-to heavily-timbered houses, in which case shading would be unnecessary. Many of the modern houses, although well adapted for winter work, admit such a flood of light and sunshine as to render shade absolutely necessary for a few hours daily during the early summer months, as, without it, so much air is required to keep down the temperature, that every particle of moisture is taken out of the atmosphere, and vegetation, of whatever kind, suffers accordingly. The aspect of the house will have much more to do in determining the question of shading than the structure itself, and the kind of glass it is glazed with is of more importance than either. Common sheet-glass is often very wavy, and with numerous lenses, and, unless a thin shade is applied, plants suffer very materially under it. I have long since observed that houses tolerably woody are preferable in every way for all purposes during the summer months to those built very light, with wide sash-bars, &c. The former afford just sufficient shade of a natural kind, that shifts as the day advances, and acts in this respect much in the same way as the numerous leaves of a tree in shading each other. It is an easy matter to have houses too light and sunny; I have seen some where it was even found necessary to shade the Vines that they contained, and the treatment they received evidently suited them, for I never saw leaves that were larger, or of better quality. In very light houses, evaporation goes on at a very rapid rate, and no doubt many of your readers have observed the poverty-stricken appearance of vegetation under such structures. To have health and free growth, there must be moisture in the atmosphere proportionate to the amount of light and sun admitted; if not, the plants soon present a starved appearance, and

become a prey to all kinds of insect pests. If it were possible to have the greater portion of the inner surface of houses covered with water, the atmosphere might be kept in a healthy growing condition, and shading would then be unnecessary; but the amount of sunlight to be admitted must at all times be regulated by the quantity of moisture that can be given off to counteract the rapid evaporation that is always going on under bright sunshine so long as air continues to be admitted. Judgment in this matter of shading, doubtless, is necessary, and experience only can teach where and under what circumstances to apply it. I note that your correspondent partly admits the necessity of shading during very hot days, as he says, on such occasions, the lights may be tilted so as to reduce the force of the sun's rays; but, then, there are many houses so built as to render this mode of airing and shading impracticable, and recourse must then be had to other means. Mr. Barnes's well-known success as a Pine grower entitles him to speak with authority on such matters, and it may appear somewhat presumptuous on my part to call in question anything he says on the subject; but I think he may see reason to modify his sweeping assertion that shade is altogether unnecessary, and even injurious, to the healthy growth of Pines. I object to permanent shade as strongly as anyone, and the moment the air is taken off, the greater the amount of sun and light that can be admitted the better, provided it is accompanied by the necessary amount of moisture, as it is the sun's warmth and light that build up and solidify the different organisms of plant life. J. SHEPPARD.

GRAFTING VINES.

THE effect of grafting Vines on various stocks is an interesting subject to most cultivators of the Grape. Having had some experience in the matter, I cannot help thinking too much is expected in the way of permanent advantages from grafting one kind of Vine on another. As a nurseryman, the whole subject of grafting has always appeared to me most curious and interesting, and some of its effects most difficult to explain. Why should one require two or three kinds of Plums to work Peaches and Nectarines upon? Can anyone guess even why a Royal George and a Grosse Mignonne will not both grow on the same kind of Plum? Why should Joséphine de Malines Pear grow freely on a common White Thorn, whilst most Pears refuse to grow on it? Why should many Pears grow freely on the Quince, whilst others will not live, or become stunted and unhealthy? Of those Pears which do grow freely on the Quince, why should the fruit of some—for instance, Louise Bonne—be improved in every way, particularly in colour, being of a fine red and yellow, when the same Pear in the same garden, growing on a Pear stock, is perhaps a dull red and green? All these are interesting subjects of enquiry, and not easy to answer; but no one will deny that, as facts, they have a practical bearing on cultivation. But, in the cases hinted at, the effect of grafting a plant on a totally different though allied kind of plant is in question; in the case of Vine-grafting it is the effect of one Vine-root on another Vine-stem and fruit. There appears to me a good deal of difference in the two cases. My own opinion is, that in a few years a Vine-root will be what the top has made it. When a young man I frequently acted as my father's foreman, and superintended the execution of orders for fruit trees. I soon found that certain Apples, Pears, and Plums had, as a rule, better roots than other kinds standing close to them, worked the same year and on the same kind of stock. The effect of the top on the root in these cases I could not doubt. Now take the case of the Vine, say a delicate weak-rooted kind, grafted on a Black Hamburg—will it continue to make as much root and the same kind of root as the Black Hamburg would have done? But this is theory; let us come to observed facts. One of my favourite Grapes is Muscat Hamburg. It always has done well with me, however grown; but many years since, finding many persons complaining of it as tender-rooted, I tried the effect of grafting it on other kinds, and was soon quite convinced it was much improved by grafting on the Black Hamburg. To my surprise, the foliage was not only stronger-looking, but slightly altered in shape; whilst the branches looked more Hamburg-shaped, and the berries were very decidedly rounder. Another Muscat Hamburg grafted on a Sartelle Frontignac was as much altered in the contrary direction—the leaves being more cut, the branches longer and thinner, and the berries more oval, than on the original plant growing on its own roots. But each year these effects were less and less apparent, and I have now two Muscat Hamburgs growing on Black Hamburgs, which no one could tell were grafted. Some years since, I saw a Vine of this variety growing in the large house at Chiswick so entirely altered in foliage, fruit, and even flavour, by grafting on a late Spanish Grape, which looked like a bad variety of Barbarossa, that I would defy anyone to have identified it; and if Mr. Barron had not assured several of us that he grafted it himself, we never should have

believed it to be a Muscat Hamburg. But Mr. Barron told me lately it had altered and improved every year, till it resembles its parent. Having sold more grafted Vines, perhaps, than all the trade put together, I still am constrained to believe the effect of grafting is but temporary, and, whether for good or evil, will disappear in four years at farthest. Even if such be the case, it does not follow that it is not worth while to give a fine Grape, thought to be a little tender, a better chance of a good start in life by placing it on a vigorous root to begin with.

J. R. PEARSON, in the "Gardener."

Dew-like Drops on Grape Leaves.—Where I now write there are three Vineries, each of which contains plants of the Frankenthal and common black Hamburg. In one of these houses—and, curiously enough, in only one—I have observed an abnormal condition of the Grapes which is very remarkable. Every morning, the Vines, especially the tips of each lobe of the leaf, are covered with moisture that bears some resemblance to heavy drops of dew; and I, at all events, am unable to give any certain explanation of the cause of the phenomenon. Possibly it may be traced to the fact, as yet unascertained, that the roots have penetrated the soil too deeply, and that an extra quantity of sap is forced through the tissues of the plant. Whatever may be the cause, however, the effect has been that on hot days, when the rods have not been tapped to shake off the accumulation, the leaves in many places have been scorched.—S.

Root Pruning to induce Fruit-Bearing Superseded.—Some fifteen years ago, writes a correspondent of the "American Agriculturist," I had a small Apple tree that leaned considerably. I drove a stake by it, tied a string to a limb, and fastened it to the stake. The next year that limb blossomed fully, and not another blossom appeared on the tree. Therefore, after thinking the matter over, I came to the conclusion that the string was so tight that it prevented the sap returning to the roots; consequently, fruit buds were formed. Having a couple of Pear trees that were large enough to bear, but which had never blossomed, I took a piece of coarse twine and wound it several times around the tree above the lower limbs, and tied it as tightly as I could. The next spring all the top above the cord blossomed as white as a sheet, and there was not one blossom below where the cord was tied. A neighbour, seeing my trees loaded with Pears, used this method with the same result. I have since tried the experiment on several trees with almost equal success. I think it is a much better plan than root-pruning. In early summer, say June and July, wind a piece of strong twine several times round the tree, or single limb, and tie it, the tighter the better, and you will be pleased with the result. Next winter or spring the cord may be taken off.

Tap Roots of Fruit Trees.—I bought an Apple orchard for the sake of the gravel underneath it. The trees were large, and probably fifty to seventy-five years old; and the ground was sand or fine gravel, very porous and very subject to drought. I removed the earth, beginning at the foot of the slope, and running a trench 10 to 15 feet beneath the trees. I found an abundance of roots running as usual near the surface, and in addition I found a large number, perhaps one-sixth of the whole, running perpendicularly the shortest cut to the wet ground at the bottom of our digging. They started, some from the body of the tree, and others from some of the main roots—having few or no branches until they reached the wet soil, where they had a multitude of short fibrous roots, having the appearance of a broom, and wholly unlike the horizontal roots in that respect. To my mind, these tap roots explained the reason why the orchard had not perished from drought years ago. I think that water was what they were after, and that alone. Otherwise, they would have had side branches on their way down, and their rootlets at the bottom would have spread farther. I have since removed some Apple trees that stood on land that seldom, if ever, suffers from drought, and they had no tap roots.—"Cultivator."

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Prolific Currant of Palluan (Fertile de Palluan of the French).—This variety has very long branches, and medium-sized red berries, similar to those of the ordinary Large Red, though perhaps scarcely of so agreeable a flavour; but, in fertility, it is surpassed by no variety, being a most abundant bearer. It is also a very free grower.—W. B.

The Cherry Currant (Groseille cerise of the French).—This is the largest of the Red Currants. The branches are short and few-berried; the berries very large, with a deep red skin; flavour acidulated. It is an early and good variety, though on the Continent, on the authority of Mr. Pynaert, it is not considered of first-rate quality in regard to flavour; but, being of much finer appearance than the common Red Dutch, it supersedes that in the markets. It is exceedingly prolific, and of vigorous constitution.—H.

TREES AND SHRUBS.

ORNAMENTAL TREES.

In planting for effect the habit of the trees employed is of the first consideration. Next to the general design, there is nothing which so much affects the appearance of a park, for instance, as the form of the trees that adorn its surface. Perhaps no tree that has grown up naturally can be called ugly; but I do not suppose anyone would think of comparing, for ornamental purposes at least, a shapely umbrageous Beech or Sycamore, with its far-spreading branches and symmetrical head, with a bare-limbed specimen of the same class. For planting in masses no species come amiss, but for single specimens for dotting the landscape suitable varieties are not so numerous. Much depends, however, on soil and situation. No trees will grow in a shapely form without room and light; nor will they be likely to withstand the hurricane unless they have reared their heads fully exposed to its force from their infancy. Hence, in parks which have been extended by clearing away the timber there is often great ruin worked among the trees that have been left, whether singly or in groups. Not far from where I write, a clump of Beeches—none of the specimens single—which was left in this way years ago to conceal a building, has been thinned out every year by one or other of its members yielding to the storm, and now but few of them are left. Thinning-out should, therefore, always be performed with great care when the trees are left with an eye to effect, and the species should be considered. The Oak will perhaps bear isolation after being “nursed” better than any; so will the Ash, though rather an ungainly tree by itself, but tall. The Elm is a somewhat dangerous tree, and so is the Lime; though one of the handsomest-shaped trees of the forest, it is often split in two at the trunk, or is apt to lose an important limb; but, when reared in the open, it is safe enough. The Horse Chestnut is a universal favourite, and forms a noble head. The Sycamore, though the foliage and smaller branches frequently suffer from the wind, presents a stout front to the storm, considering its heavy masses of foliage. The Spanish Chestnut, though of lofty bearing and luxuriant leafage, is one of the best to keep its place. In a very windy district, where it was one of the latest trees, I have seldom seen it suffer seriously when other trees were sadly mutilated. For planting to grow into specimen deciduous trees, the Lime is, I think, the one which assumes the handsomest form. A uniform and somewhat round head is its general habit, but in some situations it forms a perfect cone. In the parks about Clumber are to be seen some of the most perfect specimens of this kind. There is one tree in particular which attracts attention, not far from the Workop Road. The trunk is about 6 feet high, the head a cone, absolutely perfect in its symmetry. It could not have been clipped into more perfect shape, and, had it been in a garden, anyone might have concluded that it had been formed by the shears. It is not the only symmetrical specimen, however, of the same kind in the locality. The shape of this tree seems to be affected by the character of the soil in which it grows. It has always a very branching habit; but, in finely-divided sandy soils, the branches appear to be more twiggy and sub-divided, which helps to give the head a symmetrical shape. In heavy soils, owing to disproportion in the size of the limbs and branches, the tree is not so shapely. In both cases most likely the character of the branches indicates the character of the roots, which are no doubt influenced by the soil. Next to the Lime comes the Beech, which in the open park forms an even round head, the diameter keeping pace with the height. When cattle graze amongst the trees, they keep the branches trimmed as far as they can reach from the ground, and help to keep the trees in shape. This tree, with the Horse Chestnut and the Oak, lend a distinct character to the landscape, and are generally associated with rich meadow land and a soft undulating country, as the Fir is with the mountain slopes and Alpine ranges. How totally changed the appearance of the landscape may be by the character of the trees with which it is furnished must be apparent to the most casual observer. A few groups or rows of Poplars, rearing their tall spires against the sky, create a distinct impression on the scene; while a sky line of distant Firs, with their motionless pyramidal forms towering one above another, completely alter its aspect. The sombre Scotch Fir, too, almost darkens the face of the landscape with its sable plumes and dark masses of foliage, which throw the shining bark of its trunk and limbs into bold relief. The Firs, however, are most effective in masses or groups when a distinct effect has to be produced; single specimens are lost, unless it be on a lawn, where they are ornamental enough. The Cedar of Lebanon is of course an exception, from its unique yet ornamental habit, which associates pleasingly with some forms of architecture. Weeping trees of most kinds must be included in the handsome class, but they associate best with dressed

grounds, their branches often trailing on the surface of the lawn. Amongst these the Weeping Ash must be reckoned as one of the most ornamental, from the length of its branches and the freedom of their sweep. For grace there are none second to the Birch and the Beech. The Elm looks well on a tall stem, but when worked near the ground it has rather a stiff appearance, though such trees make excellent arbours, the branches being close and thickly covered with foliage. We have also a Weeping Pear and Thorn, the popular Weeping Willow, and Laburnum, the Weeping Lime—a noble tree—and others, all of them more or less ornamental, and adapted for pleasure grounds or parks.

J. S. W.

RAISING FEVER GUM TREES FROM SEED.

I am sending off to the River Gambia, West Coast of Africa, a quantity of the seed of *Eucalyptus globulus*, but the seedsman from whom I have bought it can give me no information as to sowing or the cultivation of the plant. Can any of your readers enlighten me on these points? If the tree possesses the disease-destroying qualities ascribed to it, its introduction into a colony so fatal to Europeans as the Gambia would be invaluable; I am therefore most anxious to make the experiment.—THOMAS C. CHOWN.

[We have no difficulty in raising the seeds of *Eucalyptus globulus* in this country, provided they are good. With a climate like the West Coast of Africa they should be sown in a northern aspect, that is, on the north side of a wall or close wooden paling, so as to keep the hot sun off them till they germinate, watering when necessary. After germination the young seedlings should be planted in rows, partially shaded, and watered. When they have become a little established, raise and plant them where they are ultimately to remain, and water freely at first. Some may be planted at once from the seed bed, where they are intended permanently to stand, provided they receive a temporary shading for a time with a close branch or large leaf, and are attended to with water till properly established. The *Eucalyptus* is not very particular as to soil. The ground in which seeds are sown should be well loosened, and not more than a quarter-of-an-inch of soil should be put over them, as the seeds are very small.—J. M'NAB.]

From the following account of the Fever Gum tree in California, as given in the “Horticulturist,” some additional information may perhaps be derived:—*Eucalypti* are rather numerous—there being not less than thirty species, of which the Blue Gum, or *Eucalyptus globulus*, ranks highest in public estimation. Of all trees, whether of this family or any other, it is the most rapid grower—besides possessing medicinal qualities which add much to its value. For a sparsely wooded region, where the temperature does not descend below 25° Fahr., no variety of tree can be grown to the same size in the same period of time. Its wood is useful for fuel as well as for manufacturing purposes. In raising this Gum tree from seeds, boxes should be made about 2 feet long by 16 inches wide, and from 3 to 4 inches deep, allowing small holes in the bottom for drainage. These should be filled up to within half-an-inch of the top with fine alluvial soil, moderately rich. The surface should be smoothed, the seed sprinkled evenly over it, and covered with an eighth of an inch of soil half composed of sand. To attain the best results the boxes should be placed in a cold frame. If sown in summer, the glass should be shaded. In the absence of glass, make a frame of boards with a moveable cover of laths nailed from one-quarter to half-an-inch apart, under which place the boxes. Water will be needed daily if the weather is warm and there is little moisture in the atmosphere, and should be applied with a fine-rosed pot. Seed treated in this way will germinate in from eight to fourteen days. When the plants are 2 inches high, begin to harden them off by allowing them more air, and increasing it from time to time until they have become hardy enough to withstand the heat of the day and the cool air at night. When 6 inches or more high they may be transplanted to a temporary or permanent place, according to circumstances. For forest culture, the young trees should be planted from 8 to 12 feet apart each way, and the intermediate spaces may be cultivated for two years, when the trees will be strong enough to take care of themselves.

Specimen Conifers at Bromesberrow Place, Gloucestershire.—The following, among others, occur at Bromesberrow Place, viz.:—*Cupressus macrocarpa*, the height of which when planted was 6 feet; after ten years' growth, 32 feet; and at the age of twenty-six years, 60 feet, with a circumference of 6 feet at the base. *Taxodium sempervirens*, the height of which when first planted was 3 feet; after ten years, 23 feet; after twenty-six years, 52 feet, with a girth of 8 feet at bottom. *Deodar*, height when planted 2 feet; after ten years, 25 feet; after twenty-six years, 48 feet, with a girth of 5 feet at the base. *Cedrus africana*, the height of which when planted was 18 inches; in ten years, 22 feet; and in twenty-six years, 48 feet, and four feet and a half in circumference at the base.—M. C. H.

A LABEL TRIAL.

I OBSERVE that some of your readers are interested in securing a good garden label for plants. A few years ago I made some in a variety of ways, using various materials for the purpose, and different sorts of ink. When finished, I fastened them to a board, which I nailed to a wall, fully exposed to all weathers. There were, in all, above 150 varieties; and I now send you two specimens which I took from the board last night, and which I consider have stood the test better than the others. You will perceive that they are made of zinc, and, as they were cut out by myself from the sheet, they were not expensive. No. 111, dated April 20, 1864, was first washed with muriatic acid to remove the grease, and then written upon; but in January, 1868, I tried fine emery-paper instead of muriatic acid, and you will perceive, by the label which I enclose, that it has stood well, and is very clear and legible. Some sheets of zinc are more apt to oxydise than others, and a little sweet oil rubbed over them when the ink is dry tends to correct this for outdoor labels; but, in a stove or hothouse, zinc has a still greater tendency to oxydise and turn white, and, if any of your readers can suggest a remedy for it, I shall be much obliged. The two labels to which I have alluded were written with an ink specially made for me by Mr. T. S. Flowers, chemist, now of Ryde, in the Isle of Wight; and my impression is that it stands better than any other ink which I have tried. You will see that I have adopted the plan of putting an eyelet into the label, similar to those used by shoemakers and others; for, as I always fasten my labels on Rose trees, &c., with copper-wire, the wire had a tendency to act injuriously upon the zinc, and the labels were sometimes cut through, and fell off; this, however, is obviated by the eyelet. I tried galvanised iron wire, but did not like it; for the thin covering of zinc cracks when twisted, thus leaving the iron exposed. I may mention that I adopt the plan, mentioned by your correspondent "J. G. N." (see p. 394) of punching Mr. London's mark into the zinc, but I write the names as well; and such labels, fastened on with copper-wire, are very permanent and inexpensive.

Hertfordshire.

C. B.

Cases of Precocious Flowering.—It is a common occurrence to find in seed beds flowers varying in shape, size, and colour, and others that differ much in the earliness or lateness of their times of blooming. In some instances these differences are very considerable. M. Carrière, writing in the "Revue Horticole," refers to some remarkable examples of this, furnished by a variety of Walnut (*Juglans regia* *preparturiens*) which sometimes produces nuts the second or third year after sowing, although the ordinary time for the fructification of trees of this kind is between ten and twelve years. Analogous peculiarities have lately been noticed both in the common *Ailantus* and in the *Weigela rosea*. Usually the *Ailantus*, like the Walnut, blooms when ten or twelve years old, and, until lately, no instance of its flowering before that period had been recorded. Last year, however, several specimens, only four months old, bloomed. As regards the *Weigela*, the blossoms showed nothing uncommon, but instead of failing to flower before the second year after sowing, more than 200 bloomed when four months old, and even earlier, one of the plants being only about 1½ inch high when this took place. M. Naudin, in a subsequent number of the "Revue," endorses the statement respecting this peculiarity in the *Ailantus*, and observes that the fact came within his knowledge fifteen years ago.

Alphonse Karr's Wistaria.—I leave my study at quarter before six: the sun is already high above the horizon; his rays sparkle like fire-dust through the leaves of the great Service trees, and shining on my house impart to it a rose and saffron-tinted hue. I go down three steps. Here we are in China! You stop me at my first word with a smile of disdain. My house is entirely covered by a Wistaria; the Wistaria is a creeping, branching plant, with a foliage somewhat resembling that of the Acacia, and from which hang numberless large bunches of flowers of a pale blue colour, which exhale the sweetest odour. This magnificent plant comes from China: perhaps you are admiring it there whilst I contemplate it here. I do not believe I exaggerate, even with you, when I declare that I think this a thousand times more beautiful than the richest palaces—this house of wood, all green, all blossoming, all perfumed, which every year increases in verdure, blossoms, and sweet odours.

Parks and Open Spaces.—The expenditure of the Metropolitan Board of Works on the parks and open spaces of London during 1874 has been as follows:—Finsbury Park, £2,750 1s. 6d.; Southwark Park, £1,818 14s. 3d.; Victoria Embankment Gardens, £792 19s. 11d.; Hampstead Heath, £521 15s. 4d.; Blackheath, £535 18s. 7d.; Hackney Commons (London Fields, &c.) £284 16s. 8d.; Shepherd's Bush, £86 2s. 9d.; Tooting Common, £90 12s. 2d.; Leicester Square, £256 0s. 8d. The total net cost was £7,137 1s. 9d.

SOCIETIES AND EXHIBITIONS.

MANCHESTER EXHIBITION.

MAY 14TH.

THE high character which the exhibitions held here have long and deservedly enjoyed was well upheld on this occasion, the display in some respects, notably that of Roses and Ferns, having seldom or never been equalled. Of Orchids there were hundreds, and, considering the earliness of the season, they were in magnificent condition. Those who are only accustomed to see the limited number of these plants shown now-a-days at the best of the Metropolitan exhibitions can scarcely realise the effect produced by the quantity and variety produced at the Old Trafford gatherings. The large exhibition building and annexe were completely filled with plants, and on the open ground surrounding the exhibition were to be seen everything conceivable in the shape of useful and ornamental appliances connected with gardening.

Stove and Greenhouse Plants (ten Flowering and ten Foliage).—In this class, Messrs. Cole & Sons, Withington, were first with a fine collection, conspicuous in which were *Azalea Duc de Nassau*, *Iveryana*, and *Conqueror*, and *Erica Lindleyana*, large and well-flowered. Among the foliage plants were remarkable examples of *Cocos Weddelliana*, *Phormium tenax variegatum*, *Cycas revoluta*, and a couple of good *Crotons*, viz., *pictum* and *variegatum*. Mr. Cypher, Cheltenham, who was second, had a remarkably well-flowered *Tremandra ericoides*, *Erica ventricosa coccinea minor*, *Genetyllis fuchsoides*, well bloomed and better coloured than usual, and *Clerodendron Balfourii*, fresh and finely flowered. Amongst his foliage plants were good specimens of *Croton Wisemanii* and *Gleichenia dichotoma*. Mr. Lingard, Bowdon, who was third, had a beautiful *E. ventricosa carnea*, *Hedera tulipifera*, *Allamanda grandiflora*, and a well-flowered *Anthurium Scherzerianum*; his best foliage plants were *Alocasia Lowii* and *Croton angustifolium*. Ten Stove and Greenhouse Plants in Flower.—In this class, Messrs. Cole were again first with a beautiful group of finely-flowered plants, amongst which were magnificent examples of *Hedera tulipifera*, large and profusely bloomed; the lovely *Boronia pinnata* in equally good condition; *Azalea Trotteriana*, a glowing mass of colour; the white *A. magnifica*, large and finely flowered; a grand *Erica aristata superba*—such a plant for size and quantity of flowers as is seldom seen. Mr. Cypher was second. In the amateurs' class of stove and greenhouse plants, Mr. Pilgrim, of Cheltenham, was first with a good collection, in which were *Anthurium Scherzerianum*, bearing sixty flowers of medium size; *Franciscea calycina*, well-bloomed and finely coloured; *Boronia pinnata* and *Pimelea spectabilis*, not so often seen as it was at one time. Mr. Thornber, Howick House, Preston, who was a good second, had a beautiful, although small, *Boronia serrulata*, *Hedera fuchsoides*, fresh and well-flowered; *Franciscea confertiflora* and *Statice profusa*. Mr. Stevenson, Lark Hill, who was third, had in his group two well-bloomed plants of *Aphelaxis*, one being an example of the large-flowered *A. macrantha rosea*, now a scarce plant.

Orchids.—These, as have been already stated, were shown in quantity and in fine condition. In the class of sixteen plants, Mr. Hubberstey, gardener to O. O. Wrigley, Esq., Bury, who was first, had large well-flowered plants, among which were splendid specimens of *Odontoglossum Phalaenopsis*, some 2½ feet across, literally loaded with lovely blossoms; *Masdevallia Harryana*, with twenty-four finely-expanded flowers, and some eight more to open; *M. Lindenii*, with an equal number of flowers; *Anguloa Clowesii*, bearing thirty clear yellow singular-looking blooms; a magnificent *Trichopilia tortilis*; *Odontoglossum vexillarium*, with ten fine flowers from a single bulb; *Cattleya Skinneri*, well bloomed, and good in colour; the old, but indispensable, *Calanthe veratrifolia*, bearing some twenty-four good spikes; and others equally meritorious. Mr. Mitchell, gardener to Dr. Ainsworth, who was a close second, had *Vanda suavis*, with six good spikes, and a darker variety of the same species, with four spikes; *Dendrobium Bensoniae*, well bloomed; *D. Wardianum*, large, but pale in colour; a fine *Cattleya Mossiae*; the beautiful *Laelia Brysiana*; and others all well flowered. Mr. Williams, gardener to J. Broom, Esq., was third. In the class of six Orchids, Mr. Hubberstey, was again first. Amongst other good plants in his collection were *Aërides roseum*, and a well-flowered *Masdevallia*. Mr. Goodall was second. In groups of three Orchids Mr. Hubberstey was first, and Mr. Williams second. Mr. Hubberstey also showed a beautifully-flowered moderate-sized *Odontoglossum Phalaenopsis* as a single specimen, for which he obtained a first prize. In the nurserymen's class of sixteen Orchids, Mr. B. S. Williams was first, with some good plants, remarkable among which were large well-flowered examples of *Cypripedium caudatum* and *C. barbatum superbum*; also of *Odontoglossum nebulosum*, and *O. luteo-purpureum*. In the class of ten Orchids, Mr. R. S. Yates was first, with a grand plant of *Aërides Fieldingii*, with three spikes of flowers, from 2 to 2 feet 6 inches in length; also, the Citron-scented *Odontoglossum* (*O. citrosmum*), with a dozen spikes of delicate blush-white flowers, and other good specimens. Among six Orchids, for which Mr. B. S. Williams was first, was a lovely *Dendrobium thyrsiflorum*, bearing a dozen fine spikes; *Odontoglossum sceptrum*; and a good *Cypripedium villosum*. In the class of single Orchids, Mr. B. S. Williams was also first.

Greenhouse Azaleas.—In this class, Messrs. Cole, who were first, had a fine specimen of *Cedo nulli*, a scarce, although old sort, but one of the most distinct in colour, and very effective. Mr. Stevenson showed in a group of six, for which he got a first prize, *Duc de Nassau*, a crimson sort. Mr. Potts, Manley Hall, who was second, had plants

a few days short of their best, but large and full of flower. Some fine Azaleas were also shown by Mr. Turner, of Slough.

Roses.—In the class of twelve, the competition was extremely close, and the plants, one and all, good. Mr. Turner, Slough, who was first, had Céline Forestier, Charles Lawson, Paul Verdier, and Madame de St. Joseph, all perfect examples of successful cultivation. Messrs. Paul & Sons, Cheshunt, who were second, showed grandly-flowered plants of Madame Victor Verdier, Juno, Princess Mary of Cambridge, and Céline Forestier. In the class of forty Roses in 9-inch pots Messrs. Paul & Son were also first, with a magnificent collection, furnished with very large flowers of every tint and colour, from the deep purple of Fisher Holmes to the delicate Madame Lacharme. Mr. Turner was second with a beautiful group, and Messrs. Lane, Berkhamstead, were third.

Eighty Alpine and Herbaceous Plants.—Of these, two beautiful groups were staged by Messrs. Rollisson & Sons, who were first; and Messrs. J. & W. Yates, who were second. These, set on the turf on slightly elevated ground, formed a charming feature, representing, as they did, almost every genus that can be had in flower at this season.

Ferns.—Amongst stove and greenhouse kinds the competition was so close that it was difficult to determine who was first; after close scrutiny, however, Mr. Thornber was awarded the first prize, for a group in which were three examples of *Gleichenia*, viz., *rupestris*, *Speluncæ*, and *flabellata*, each from 7 to 8 feet through, strong, and deep green—such plants, indeed, as could scarcely be elsewhere matched. Amongst tree Ferns in this collection was a fine specimen of the rare *Cyathea Dregei*. Mr. Hubberstey, who was second, had matchless plants of *Davallia Mooreana* (7 feet through, some of the fronds measuring 2 feet across), *Gleichenia flabellata*, the elegant *Nephrolepis davallioides* (8 feet across, a perfect fountain of drooping fronds), a good example of *Brainea insignis*, and some large and good tree Ferns. The first prize for hardy kinds was won by Mr. Thornber, whose plants were large, and in splendid condition; Mr. Handley, Prestwich, was second, with a group fine in every way; and Mr. Crowe was third with a beautiful collection.

Fine-foliaged Plants.—These were shown in large numbers and in beautiful condition. In the class of eight kinds, Mr. Elkin was placed first; but on what grounds we leave the judges to say. His best plants were *Cordyline indivisa* and *Latania borbonica*. Mr. Thornber, who was second, had a beautiful group, in which, amongst others, were *Gleichenia rupestris*, *Croton undulatum* (well furnished with finely-coloured leaves), *Cycas circinalis*, *C. revoluta*, and *Dasyllirion gracile*. Mr. J. Gresty, who was third, had a fine example of *Eurya latifolia variegata*, and *Cibotium regale*. Here, again, it may be added that the decision of the judges was not in any way satisfactory, the plants to which the first prize was awarded not being considered worthy of any prize at all. In the class of six fine-foliage plants, Mr. Williams was first, with a group in which were *Maranta Veitchii*, *Pandanus Veitchii*, and *Gleichenia semi-vestita*, all in excellent condition.

New and Rare Plants.—Of these Mr. Williams had a fine group, in which were *Æchmea Marie Regine* and *Adiantum gracillimum*. In Messrs. Rollisson's group, which was placed second, the most remarkable plants were *Croton Cooperii* and *Dracæna Baptistii*. Mr. Wills was third. Mr. Thornber, who was first in the amateurs' class, showed fine plants of *Martinezia erosa*, *Vriesia reticulata*, and *Dracæna Fraserii*.

Miscellaneous Subjects.—Of *Rhododendrons*, Mr. R. S. Yates showed a good bank of finely-flowered plants. Messrs. Standish & Co. also had a fine collection. Messrs. Cole, Yates, Pilgrim, and Smith showed some good Cape Heaths. *Ivies* (in pots) came from Mr. Turner, hardy evergreen trees and shrubs from Messrs. Caldwell and Messrs. Lane, succulents from Messrs. Rollisson, dinner-table plants from Mr. Thornber, Palms from Mr. Broom, Mr. Smith, and Mr. Yates; *Dracænas* from Mr. Wills, Messrs. Rollisson, and Mr. E. Boden; *Yuccas* from Messrs. Cole & Pavin, who had magnificent examples of *filamentosa variegata*, very large, and in splendid condition; and variegated Japanese plants came from Messrs. Standish. Bunches of cut flowers were furnished by Messrs. Cole, Yates, and Binns; wedding and ball-room bouquets by Mr. Yates and Messrs. Turner and Cypher. Mr. Bruce received an extra prize for remarkably well-grown *Sarracenias*, among which *S. rubra*, one of the scarcest plants in cultivation, was quite a model of good management. Mr. Williams and Mr. Wills each exhibited a large and fine group of miscellaneous plants, as did also Messrs. Dickson and Robinson. Hardy Conifers were shown by Messrs. Cardwell and Messrs. G. & W. Yates; and bronze and tricolor *Pelargoniums* by Mr. Gresty, whose plants were large and well-grown. In the nurserymen's class, Mr. Turner had a finely-coloured collection. Show *Pelargoniums* were shown by Mr. Rylance, whose plants were not extraordinarily large, but well flowered and good in foliage. Messrs. Jackman & Son contributed *Clematises*—magnificently flowered plants, amongst which were *Duke of Norfolk*, *Thos. Moore*, also several unnamed seedlings. Messrs. Standish also showed in the same class.

Double Furze.—Most people are acquainted with the single-blooming Gorse or Furze which is so abundant in many places as to be almost looked upon as being beneath notice from its very frequency. The double-flowering variety is, however, more valuable, and those who are in want of a showy yellow flowering shrub, worthy of the name, should try it. I have seen it in all sorts of positions, and in all it has a good appearance. It blooms, more or less, throughout the whole year, and the intensely yellow flowers are especially useful for distant effect. It thrives perfectly in any soil, from a pure, hot, dry sand, to the very best loam. Young plants of it, about a foot high, are best for planting, as, when of this size, they succeed better than when larger.—J. Muir.

NOTES AND QUESTIONS—VARIOUS.

New Support for *Tropæolum tricolorum*.—A piece of old fish netting fixed near the glass, at the end of a greenhouse, makes a capital support for this plant. I have had several square yards of it a mass of bloom, and the admiration of all who have seen it.—ALFRED PAGE, *Bulwell, Notts.*

A Fine Ginkgo Tree.—A few years ago I saw growing in the grounds of the Earl of Coventry, at Groom Court, a fine specimen of the Ginkgo, or Maiden-hair tree (*Salisburia adiantifolia*). As it was the largest I had ever met with, perhaps some of your correspondents will favour us with its dimensions.—B.

Camphor as a Fertiliser.—From time to time I have seen in the papers that camphor diluted in water is an admirable fertiliser. What proportion should be given to one gallon of water, and should I water the roots or foliage.—E. N. H. [We are not aware that there are any proofs of its effects in this way.]

Seedling *Mimuluses*.—We have sent a selection of our *Mimuluses* for your inspection and opinion of their relative merits.—E. G. HENDERSON & SON. [The flowers received were of large size, possessing bright and beautiful colours, and evidently belonging to a fine "strain" of these too much neglected, but really useful, plants.]

Cutting Back *Rhododendrons*.—What is the best time for cutting back *Rhododendrons* so as not to interfere with their flowering? Some of my large common *Rhododendrons*, which were growing too luxuriantly over the walks, and which had to be pruned back, and present now an unsightly front of cropped branches with no promise of flowers.—QUEBIST.

***Pinguicula vallisneriæfolia*.**—This is now producing its large and beautiful bluish-violet flowers with a whitish centre. The leaves of this species grow to a considerable length, sometimes from 6 to 9 inches. It is a plant which should be grown in very damp but well drained, and rather shady situations on rock-work.—R. P.

***Lithospermum Gastoni*.**—This is certainly one of the finest border plants with which I am acquainted, especially for a dry but deep soil. In the York Nurseries it forms perfect hillocks of bloom, the flowers being so closely packed as almost to conceal the foliage. The colour is a pleasing sky-blue.—R. P.

New Japanese Radish.—The new Japanese Radish or Daicon (*Raphanus* of French gardeners) has been tried in many French gardens with much the same result. All those who have grown it think it may prove very useful as a fodder plant, but hitherto it has gained little favour for the table. The same remark applies to a new Russian variety called Rave Garwoski.—H.

The Best Early Cabbages.—Amongst all the early varieties named in catalogues, I find none to come in before Downton Castle; on the 23rd of April I cut nine dozen. My next favourite sort is Pearson's Chilwell Conqueror, which we are now cutting in quantity. Both these sorts have the advantage of making Cabbages instead of leaves, and may, therefore, be planted much closer than the loose-growing varieties.—J. MILLER, *Clumber*.

Strawberries at Christmas.—Mr. Gilbert need not fear of success in having Strawberries at Christmas if he pots the different sorts of Strawberries in succession; keeping back will be his only difficulty. Mr. Jefferson, Carlton House, Worksop, is the best cultivator of late Strawberries with whom I am acquainted. I have known him to produce fine shelves of Strawberries from early-forced plants during the months of November and December.—J. MILLER, *Clumber*.

French Beans at Burghley.—I have heard of Potatoes that had to be cut in two before they could be got in at the door; Mr. Gilbert's French Beans must be related to these Potatoes. I find I can nearly cram the haulm of forty pots of French Beans, including the Beans, into a peck measure, but Mr. Gilbert gets a peck of Beans off forty plants at one gathering! Did his foreman climb up the Beans to gather them? Would Mr. Gilbert mind measuring one of these Beans, when he has time, and furnish us with the dimensions? I should also be glad of a few seeds by goods train.—CA. CANNY.

Cannas on Lawns.—I know nothing which has a more striking appearance on a lawn than a bed of Cannas. Their exotic-looking foliage seems to lend a special charm to the picture which a well-kept lawn, with properly disposed clumps, and good single varieties of Coniferous and other trees make up. Let them be only out of the fury of the wind, on an elevated bed, with a good border, such as *Stachys lanata* makes, and they form a fine feature. It is best to put a row of something inside the border or edge, as, say a row of Dell's crimson Beet; it hides the bareness of the stems of the Cannas at the bottom.—N. H. P.

The Mexican Mayflower.—We have received a flower of a very large and handsome variety of the Mexican Mayflower (*Lælia majalis*) from Mr. Hill, gardener to Sir Wm. Marriott, Down House, Blandford. The flower sent to us was fully 8 inches in diameter from tip to tip of the petals, the latter, as well as the sepals, being of a bright lilac or mauve tint, and crimped or frilled towards the edges. The lip is of ivory-whiteness, margined with rosy-lilac, and richly spotted with amethyst-purple. The crest is lemon-yellow, and the contrast of these delicate colours is very pleasing. This is one of the rarest and most beautiful of the New World Orchids, but is somewhat difficult to flower.

***Lilium Washingtonianum*.**—Messrs. Backhouse know too much about plants, both species and varieties, to write "*L. Washingtonianum*, new species," and it is to be regretted that Mr. Wilson should ascribe to them what they did not say. What they really wrote was:—"Lilium, new sp.? California. Allied to *L. Washingtonianum*; grows 6 to 10 feet high, and bears as many as forty flowers on the spikes, very fragrant. Regarded by the collector as either a distinct variety of *L. Washingtonianum* or a new species altogether." Mr. Wilson does not realise that *L. Washingtonianum* is a species and not a variety, or at least I gather so from his concluding remark at page 416.—WILLIAM BULL.

A North Wall Best for the Flame-flower.—*Tropæolum speciosum* does not do well on a south aspect. I find a north wall, sheltered from winds, to be most suitable for it; but it is such a rambler that it is difficult to keep it in its place. The stolons appear many feet, sometimes even yards, from the parent, which then sickens and dies. This may be from its having exhausted the elements of the soil essential to its well-being, as is the case with many other plants of similar character. The best way to treat it is to keep reserve plants by tracing back the suckers and potting them. Remove the old plant, replace the spent soil by a barrowful of light, rich, sandy compost, and then plant; the result will be strong growth and fine bloom; at least so I have found it. This should be repeated every three or four years.—J. M., *Hawkechurch, near Axminster, Devon*.

Frosted Glass for Screens.—This is made by laying the sheets horizontally and covering them with a strong solution of sulphate of zinc. The salt crystallises on drying.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

PLEASURE GROUNDS: THEIR EXTENT AND MAINTENANCE.

A PREVAILING error in English flower gardening is to attempt to keep too great an extent of ground in that order which is requisite in a dressed garden. I call it an attempt; for, in the majority of cases, it is nothing more; and this is so apparent as to exhibit nothing so distinctly as insufficient means, and consequent mismanagement. "A small farm well tilled, and a small house well filled," is an old maxim, the point of which may be applied with more force to the garden than any other department. Large flower gardens and pleasure grounds indifferently kept are not creditable adjuncts to a noble mansion; and, if this fact was more generally recognised, we should see fewer ill-kept gardens and better gardening. Practically speaking, a gentleman's pleasure grounds are not generally circumscribed by his ha-ha or his garden wall. He has his park and his woods; and, even if he desires his pleasure grounds proper to be extensive, there is no reason why he should not gratify his taste; but there should be no greater attempt at dressing and "keeping" than can be thoroughly done. If he desires acres of shrubbery and woodland, with pleasant walks and lawns, he may fitly combine the park with the garden, and yet secure that order and neatness which the character of the place suggests, and one naturally expects to see. One mistake is having too great an extent of flower-beds, with their intricacies of Grass or gravel walks, and Box or other edgings, which are so common. Where these are laid out and kept with taste, it alters the case; but what can be more slovenly in appearance than a great parade of floral decoration with an ill-kept lawn, lanky untrimmed edgings, and dirty walks? That this is no imaginary picture many will testify. A still more common mistake is in having too great an extent of closely-mown lawn. The fresh, green, and well-kept sward is certainly an indispensable and highly ornamental feature of our English pleasure grounds; but the labour it involves is great, and in nine cases out of ten some other important department suffers in consequence at the very time it requires the most attention. Keeping every foot of Grass in the grounds in "mowing machine order" is a practice for which there is no excuse. Besides, it precludes the possibility of growing many kinds of beautiful hardy plants, such as Primroses, Lilies, Daffodils, &c., that might otherwise have a place, for these cannot exist long where the lawn is mown regularly. Not long ago I saw, in the extensive pleasure-grounds of a nobleman, a blending, so to speak, of the garden and lawn with the woodland and the park, and with the most happy effect. In the garden front of a fine mansion—an imposing pile, which some landscape-gardeners would have considered incomplete without the usual terraces and parterres—there was nothing but a broad open expanse of well-kept lawn, thinly and irregularly dotted with ornamental trees and shrubs, with a few flower-beds and Roses in suitable situations near the mansion. Beyond the lawn, the ground rose into a natural thicket of trees and shrubs, with Gorse, tufts of Heath, Sweet Briars, Roses, Daffodils, and whole sheets of Primroses, Cowslips, natural Grasses, &c., in the foreground. Even Nettles and Docks were present; indeed, no "keeping" was attempted at all, unless it might be an occasional interference here and there, to prevent the law of natural selection from operating too decidedly in any one case. From this pleasant scene, which impressed me by its repose and the absence of glare, there wound towards the kitchen gardens, and other parts of the grounds, a broad well-kept walk, with wide margins of Grass on each side, having an irregular back line, and again the trees and shrubs rose up behind into a thicket in which the birds sang and built their nests in peace and security. The general effect was anything but untidy; the walks looked trimmer, and the Grass greener, contrasted with the rough natural coppice in the background. Throughout the extensive grounds, floral and other decorations were not forgotten,

but no more was attempted than could be done well, and it was not deemed essential to have a loud-toned display in front of the windows only and nowhere else. What was done in this case might be done anywhere, and under quite different circumstances. In very extensive pleasure grounds, where many acres of Grass, no part of which was in sight of the mansion, had to be regularly mown with the machine or scythe, and the outlines of the Rhododendron beds and shrubbery borders were pared and trimmed with the utmost exactness, at the expense of a neglected kitchen garden and hothouses, no better effect was produced, in my opinion, than if the undulating surface of the ground had been simply traversed with broad Grass paths, drives, or openings, and the rest left in a partial state of Nature, while the expense of keeping would have been reduced by two-thirds. I never was an admirer of formally laid out beds of Rhododendrons, or groups of single species of plants that had nothing more to recommend them than a blaze of colour for one month in the year, and played a comparatively useless part for the remaining eleven. Even a Rosary is a flat affair by itself, and to me an objectionable and utterly ineffective way of showing off the beauties of the queen of flowers, which never looks so well as when associated with other forms of vegetation. These remarks are made in the knowledge of the fact that the expense of gardening in these days of high wages has become a serious consideration to proprietors, and the difficulty has to be met by reducing the staff and working expenses—a course which has been pretty generally adopted within the last few years; hence the necessity of a change of tactics in garden management. Pleasure grounds are a luxury that must be paid for; but when such expensive structures as glass houses are neglected on their account, and cannot be utilised to the utmost for the want of labour and other means, it is a sheer waste of money; and the same applies to the kitchen garden. Market gardeners and nurserymen understand this, and the thorough manner in which their houses are employed might well be copied by private growers. To me it has often been a source of regret that the entire garden staff had to be employed two or three hours at least every day, from April till November, cutting Grass, which afterwards required the whole day's labour of several men to clear up, and attend to the consequent clipping, hoeing, and trimming which it occasioned; while fruit trees and crops had to go uncared for, and many things of real interest or utility were neglected. C.

Cutting Back Rhododendrons.—Allow me to recommend "Querist" (see p. 436) to cut his Rhododendrons back immediately they have done blooming. For that operation there cannot possibly be a better time, and, if cut back into the old wood, they will break freely.—JOHN WATERER, *Bagshot*.

— "Querist" should cut his Rhododendrons back in the winter by partial pruning, viz., cutting back some of the longest branches only to their base, and thus reduce the outline of the plant 2 or 3 feet. He would then have a fair amount of bloom, more or less in proportion as he thinned the plant, and it would still have the appearance of a naturally-grown plant. By annual prunings, he may reduce it to any size he wishes. The plants would now be starting freely and thickly, and a common observer would not know they had been touched. Large clumps here, pruned in this way, are no larger than they were twenty years ago.—JOHN GARLAND, *Killerton, Exeter*.

The Flame Nasturtium among Rhododendrons.—Twelve or fourteen years ago, I planted this among and near the margin of large masses of Rhododendrons, and each year it grows up among them most luxuriantly about 8 feet high, flowers beautifully, and is much admired. The natural soil is a rich light loam. The choice kinds of Rhododendron are planted in peat. This plant does as well on the sunny as on the more shaded side of borders.—JOHN GARLAND, *Killerton, Exeter*.

Privet Hedge Grafted with Lilac.—It would be useful information if anyone would give us a list of shrubs that might be grafted on Privet, or Thorn, or other hedge material. I have Pears growing and fruiting on a Quick hedge. On a Privet hedge here I grafted Lilacs at certain distances apart, in order to break its monotonous and formal appearance, thus rendering it more ornamental. The Privet was formed into a series of scollops several years since, and no difficulty exists in maintaining the desired shape. On the crest of each curve Lilac was grafted, a convenient shoot from the Privet being selected on which to place it; this has continued to grow and bloom with considerable vigour, and is a very pleasing feature in the garden.—W. INGRAM, *Belvoir*.

Plants in Flower at York.—The following choice plants, some of them new, are now finely in bloom in Messrs. Backhouse's nursery at York, viz.:—*Cypripedium arietinum*, *C. Calceolus*, *C. macranthum*, *C. pubescens*, *Dianthus glacialis*, *D. Fischeri*, *D. alpinus*, *D. neglectus*, *Mertensia alpina*, *M. sibirica*, *Primula Parryi*, *Edraianthus Kitaibelii*, *E. pumilio*, *E. pumilorum*, *E. serpyllifolius*, *Aquilegia glandulosa*, *Petrocoptis Lagasce*, *Rosa alpina* var. *pyrenaica*, *Polygala calcarea*, *Lewisia rediviva*, *Eritrichium nanum*, *Pentstemon humilis*, *P. acuminatus*, *Cyclobothra pulchella*, and *Cypripedium acaule*. The English *Cypripedium* (*Calceolus*) is flowering in great groups of thirty flowers in each, twice the size of the ordinary ones, and many have two flowers on one stem. There is also a grand Siberian species now in flower, a rich crimson, called *macranthum*.—NOEL HUMPHREYS.

NOTES OF THE WEEK.

— THERE is now a long and stately fringe of the Royal Fern pushing vigorously up beside the water under the tree near the lower end of the Serpentine. This addition is one of the happiest that has been made to the permanent attractions of the public gardens of London.

— GOOD French Cherries have been abundant in the London markets during the past week. They are grown about Avignon, and in the adjoining districts.

— THE curious Californian *Saxifraga peltata* or Umbrella plant is now in flower at Kew, where it may be seen in the herbaceous department. The plant is a native of the woody region of the Sierra Nevada, where we have met with it in company with the fine Lilies that are now becoming such favourites with cultivators.

— A SPECIAL exhibition of Roses is to be held in Lyons on the 11th, 12th, and 13th of next month. The judges are to consist of English, German, Belgian, Italian, Swiss, and French Rosarians. Several seedling Roses will be shown on that occasion for the first time, and English Rosarians are invited to send theirs.

— THE Maryland Peach growers anticipate an unusually heavy crop, the lateness of the spring having delayed the opening of the buds, so that they did not suffer from the April frosts. The art of canning the fruit is now so perfect that the state of the crop in the great Peach region of the eastern United States is of interest to all the world.

— AN enumeration has just been made of the number of trees planted during the past season in the avenues and boulevards of Paris to replace such as have died, and the total is found to be 178,000.

— THE long "flower walk" in Kensington Gardens is, so far as its trees and shrubs are concerned, interesting and beautiful for a considerable portion of the year; and we should like to see it made more so as regards perennial and Alpine plants. It offers the finest opportunity that could be desired for the formation of a "mixed border" of the best kind. The mixture of "bedding-out plants" and other subjects, dotted at regular intervals all along the border, which has for many years been the rule here, is not the most desirable. The aim should rather be to give each twenty yards' length of the border an aspect of its own. This need not prevent a good many individuals of any favourite kind from being planted when desired.

— THE Royal Botanic Society's Evening Fête will be held on Wednesday, July 14th, on which occasion prizes will be offered for various kinds of table decorations, and for bouquets, hanging-baskets, &c., and for groups of plants arranged for effect. The gardens are even more than usually enjoyable this year, notwithstanding their disfigurement by various contrivances, placed in conspicuous positions, to assist in the taking of meteorological observations. It is laudable in the Society to take so much interest in so important a branch of knowledge; but that is no reason why the best example of landscape-gardening art to be seen in any public garden in or near London, should be disfigured by such nondescript abominations as that which now crests the top of the mound on the right, as the visitor enters the garden from the front gate.

— A SPECIAL meeting of the Fellows of the Royal Horticultural Society was held, on Tuesday last, to receive a communication from the Council, and an answer to certain proposals made by the Council to her Majesty's Commissioners. Lord Bury, who presided, said that a reply had not yet come to hand from her Majesty's Commissioners, but he hoped it would come in the course of the next ten days, and he moved an adjournment for that period. He then referred to the fact that actions in the county court were being taken against the Society by gardeners who had won prizes last year and had not yet been paid. If those proceedings went against the Society, the Council would file a declaration of insolvency to protect their other creditors. This statement of the President gave rise to a long and excited discussion, in which Mr. W. A. Lindsay (late hon. secretary), Dr. Kellock (member of Council), Sir A. Gordon, and Mr. Guedalla took part, it being strongly urged, by some of the speakers, that the prize-money due to exhibitors should be paid. Mr. Dobree (treasurer to the Society) said they had at their bankers about £2,000, and, if he paid these prizemen the £1,400 due to them, the Society must come to a standstill. He objected to sign any cheques to pay the prize-holders. Dr. Denny asked what was to become of the show to come off on Wednesday, the 2nd of June? Would it not be better to close the gates of the gardens than to take 7s. 6d. for admission? The chairman replied that on the last occasion they considered the show was not sufficiently good to warrant the prices demanded, and they accordingly only charged 1s. for admission. For the present they had better accept the adjournment, and then decide what was best to be done. The meeting then adjourned until the 4th of June.

JUDGING TULIPS.

IN a circular on this subject, Mr. Barlow, the secretary to the Royal National Tulip Society, thus addresses the subscribers to that association:—"After full consideration, it has been proposed that on the morning of the exhibition on the 29th inst. twelve of the most prominent growers, men who are in every respect competent to judge the flowers, four from Lancashire, four from Derbyshire and Nottinghamshire, and four from Warwickshire and Yorkshire, be selected as judges; and that they be balloted for and divided into four lots, one from each section going into each lot. This will give four sets of judges, three judges to each set. One set will be sent to judge classes 1, 2, and 3; another, classes 4, 5, 6, and 7; another, classes 8 and 9; and another, classes 10, 11, 12, and 13. From other growers not engaged as judges, a sufficient number must be selected to assist the secretary in his duties, and also to assist the judges by assorting the blooms in the classes for single blooms. In judging the classes for single blooms the best flowers will be selected, but not labelled until the pans are all judged, and the losing ones carefully looked over, and the best flowers in them selected and tested against those already selected as the best among the single blooms. The advantages of this plan (says Mr. Barlow) are obvious. 1st. We shall save the expense of hired judges, say about £5, which sum will be more effective in the prize list. 2nd. We shall have the best judgment in the country, and should any judge be selfish enough to prefer his own flowers (a result not likely to happen, as every judge will be on his honour to judge impartially), he will always have two judges from a distance, not neighbours to contend against. 3rd. Congenial employment will be found for most of the exhibitors, instead of wasting time, as is usually done, in waiting for the decision of the judges. All the business can be got through in good time and everything finished, arranged, and in good order for visitors by one o'clock."

The Madder Plant.—Versmann states that the Madder plant has been cultivated in Holland for more than three hundred years; France (especially the neighbourhood of Avignon) now produces about one-half of all the Madder consumed, to the value of about £750,000 per annum. Turkey and South Russia also supply considerable quantities of high quality. Some experiments in cultivating Madder in this country were made in Derbyshire some years ago, but with indifferent results, though the plant is quite hardy in England. The Dutch Madder will dye red, but not purple, and the colour is not fast. Naples Madder dyes good red and purple, but the colours are not fast; that of Turkey dyes good red and purple, and is very fast. France supplies the market with two qualities, called "rosées," from their dyeing beautiful reds and pinks, and "paluds," which give a good purple, besides a fine red; this is the best French quality. The last name is derived from the fact that the plants are grown on marshy land.

The Food of Moles.—A correspondent of the "Field" communicates his knowledge of the movements of a tame mole now in the possession of Mr. Howlett, Newmarket. It is kept in a large propagating glass that holds about three pails of earth; and in this it works its subterranean passages and throws up the hills. Its food consists of earth-worms and wire-worms, and from the careful observations of Mr. Howlett it consumes daily about 100 worms, which are supplied every morning. It is quite at home, and feeds freely out of the hand of its master.

Grand Monarque Narcissus.—Amongst dozens of other varieties lately in flower this has been very conspicuous; some spikes of it have produced as many as eighteen and twenty blooms. For massing in beds or growing in pots it justly deserves to be extensively used everywhere. It belongs to the section of *Polyanthus Narcissus*. The individual blooms, which are large and pure white, have a yellow cup.—J. Muir.

French Beans at Burghley.—Your correspondent, "Ca Canny" (see p. 436) tries to be humorous; but that is an art that it takes many years to master. I would advise him to give up the endeavour, and try his hand at growing French Beans in pots. Let him obtain Red Flageolet, true to name, put four Beans in a 16-sized pot, when the flowers are open give the plant some liquid manure, and he will find no difficulty in obtaining a peck of Beans from forty pots all gathered at one time. We have had French Beans here all the winter; but just now (May 24th) we have plenty of young Peas, both Ringleader and William the First. Therefore our French Beans are now all clean cut.—R. GILBERT, Burghley.

Seedlings of Tropæolum Minnie Warren.—When writing recently in your columns of the merits of the variegated-leaved *Tropæolum Minnie Warren* as a bedding plant, I stated, as an additional recommendation, that it re-produced itself true from seed. I have now to inform such of your readers as take an interest in the forms and causes of variegation in plants, that I have learned from further observation that although the seed of this beautifully variegated plant germinates with great facility, and produces seedlings with three and four leaves, yet these seedlings cannot live, being destitute of chlorophyl; or, in other words, are altogether of a creamy-white, without any green in either leaves or stem whatever; they consequently soon dwindle away and die. The only way, therefore of re-producing this plant is by means of cuttings, which, fortunately, root with the utmost facility.—W. E. G.

IRRIGATION OF MARKET GARDENS.

MARKET-GARDENS, by reason of the greater value and constant succession of the crops raised upon them, will, in most cases, permit the application of more costly methods of irrigation than any other cultivated grounds, and from their smaller area there is less difficulty in procuring an ample supply of water. Few gardens are so situated

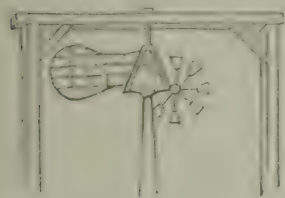


Fig. 1. Windmill for raising water.

that water can be procured from a stream without the employment of a water wheel or other motive power, a force pump, with pipes laid underground, and a reservoir in which water may be stored when not needed. But nearly every one may be supplied from a well by the use of a windmill. A windmill of the smallest size made, costing about £20, is able to raise one quart of water per second to a height of 75 feet. Such a windmill may be constructed by an ordinary mechanic

at a cost of from £2 to £5, which will answer every purpose of those manufactured and sold at higher prices, excepting that of regulating themselves to the varying forces of the winds. A mill of this character (fig. 1) may be fixed in a frame over the well, and the arms, of which there may be six, eight, or more, with fans fixed so as to present their faces at an angle of 45° to the wind (fig 2), are kept in position by means of a vertical vane behind them. Another, which consists of six arms mounted upon a rotating frame, carries cloth sails (fig. 3). A crank is attached to the axis of the wheel which works the pump-rod. This mill requires to be changed as the wind changes, and a ladder is attached to the frame upon which it is mounted for this purpose. A one-horse railroad power would also serve a useful purpose in raising water from wells into an elevated reservoir, where it could be stored for use.

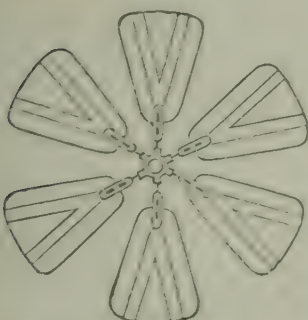


Fig. 2. Fans of Windmill.

For small gardens, the water from the roofs of the buildings may be collected in tanks or cisterns, raised at least 12 feet above the level of the ground. A round tank, hooped with iron bands, 12 feet deep, and 15 feet in diameter at the centre, will hold over 15,000 gallons. A square tank may be made of planks, jointed and matched, which are forced closely together by

wedges, acting upon a timber frame which incloses the planks. This is the cheapest kind of tank that can be made. One 16 feet square, and 10 feet deep, will contain nearly 20,000 gallons. Tanks of this character can only serve for small gardens, or to store water which is pumped at night for use during the daytime. Either of these tanks, if filled during the night (to do which will require a stream from a pipe of an inch-and-a-half in diameter constantly running), and replenished during the day, will furnish enough water to give more than 1 inch in depth over an acre of surface. This is the least quantity that could be depended upon in a dry season for any effective purpose, and would need repeating at least after four days, so that the maximum effort of a tank of

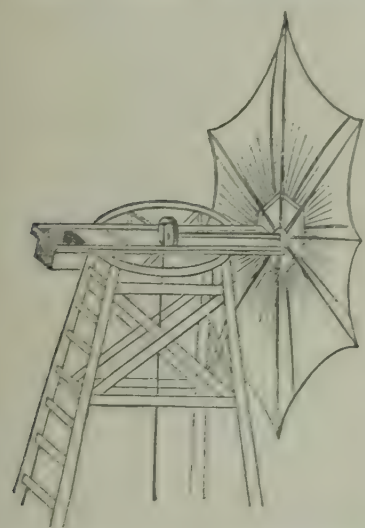


Fig. 3. Windmill with cloth sails.

this size, with a well, windmill, or horse-power attached, would suffice only on an emergency to water 4 acres of land. When the ground to be irrigated is of larger extent, the supply of tank room and water must be enlarged, or the diameter of the pipe and the power increased. The capacity of the pipe increases as the square of the diameter; by which is meant that, if the diameter is doubled, the capacity is quadrupled. Thus, if a pipe 1 inch in diameter supplies 1 quart per second, a pipe of two inches diameter will furnish 4 quarts per second (or 2 multiplied by 2), and a pipe of 3 inches diameter will yield 9 quarts (or 3 multiplied by 3) per second. At the same time the power must be increased proportionately to the amount of water elevated, or disappointment will result. In estimating power a large allowance must be made for loss. A horse working in a railway power can only raise an equivalent of three-fourths of his weight; the rest disappears in friction; and when a stream of water is forced through a pipe of small diameter for a considerable distance, the loss of power in friction is very large, and another fourth of the horse's effort must generally be allowed to compensate for it. One horse may be expected to raise 180 quarts

1 foot high every second, or 6 quarts to a height of 30 feet. The small-size windmills are about one-sixth of one horse-power. Where streams are available, the supply of water will be found most ample and economical. No storage tanks are needed in which the water must remain for a time of lesser or greater duration, that its temperature may be raised nearly to that of the soil, as when wells are used. The water may be taken directly from the stream and flowed upon the ground. A low dam of 2 feet in height may be constructed of planks across the stream, by which power to run a small undershot wheel may be secured. Where there is facility for backing the water to a greater extent, or of procuring a greater fall, a breast-wheel may be used. A dam 4 or 5 feet high will be sufficient for a wheel of this kind, if the stream is 4 feet wide and 6 inches deep, and runs with a velocity of two miles per hour. Such a stream with this fall of water would give sufficient power to elevate about 6 or 7 quarts of

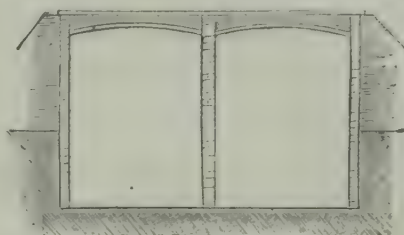


Fig. 4. Covered cistern for holding water.

water per second a height of 30 feet, or a sufficient supply for about 7 acres of ground. To calculate the nominal horse-power furnished by a fall of water, the velocity of the stream in feet per minute, the height of fall, and the sectional area (the width and depth) of the stream in square feet must be multiplied together and divided by 33,000.

If it be found necessary to store the water thus elevated so as to extend the area that may be irrigated, cisterns of substantial construction will be required. These should be of brick or stone laid in cement, or hydraulic lime, and strengthened with buttresses upon the outside. A bank of earth should then be heaped up around it and sodded or terraced; in the latter case it will be utilised by planting it. Such a tank, of considerable size and great utility (see fig. 4), may be dug in the ground at the highest part of the garden, to such a depth that the soil excavated will make a retaining bank to

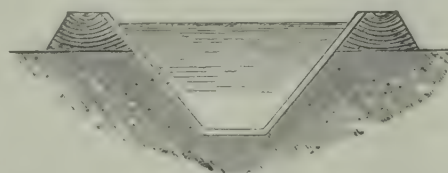


Fig. 5. Open cistern for holding water.

support the portion of the wall that is above the surface of the ground. This tank, which is circular, may be covered with an arch of brick-work, and may be surmounted by a tool-house or other useful building. In this case a brick shaft 2½ inches thick each way

should be built in the centre, from which the arch would spring to the circular wall of the cistern; the wall should be 9 inches thick, and the bottom may be either of bricks laid flat or of cement laid upon the earth. This cistern, if 20 feet in diameter and 12 feet deep, would hold 30,000 gallons, or enough to water over 3 acres at one time. If the cistern is open the wall could slope outward, making an inverted frustrum of a cone (as seen in fig. 5), 32 feet wide at the surface, and 8 feet wide at the bottom. The earth thrown out of the bottom will form a support for the upper portion of the wall. But before the wall is built the earth thrown out should be solidly rammed down in layers made hollow or of the form of a basin. This form is shown by the curved lines in that part of the engraving. There is a large variety of pumps adapted to the purpose of irrigation, but the severe uses to which they are put make it desirable to have only those which are constructed entirely of metal. Leather valves are soon worn and become useless, causing delays and serious loss of time in repairs. The double-action force-pumps with

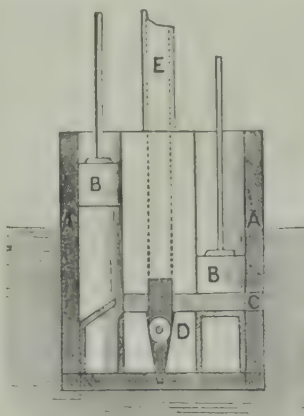


Fig. 6. Section of double-acting force pump.

metal valves, or the rotary pumps of the ordinary kind with metal pinions which work into each other similarly to cog-wheels, or those which work upon the old-fashioned principle of the Archimedian screw, but which, nevertheless, are protected by a modern patent, are all suitable for this work on account of their durability. A double-acting force-pump of the most simple character (fig. 6), made almost entirely of wood, is one of the best for that purpose on account of its cheapness and the ease with which it may be kept in working order. It is formed of a block of wood (A A), in which two parallel holes are bored lengthwise. In these holes the plungers (B B), made of wood—maple being preferable—are worked by rods affixed to a rocking shaft in connection with the power above the ground. Between these holes a smaller hole, shown by the dotted lines, is bored. This bore

is made to communicate with the other two by a hole bored from the outside (seen at *c*—that portion shaded, and where the letter is seen, being afterwards plugged up). A leather valve is placed so as to close the ports of this last hole, and turn the current of water into the pump-tube. This valve is inserted into a dove-tail mortice cut in the bottom of the plank. A slotted plug (*d*) holds the valve, and is placed and fixed in a proper position in the mortice. The lower portion of the mortice is closed with a plug. To insert the slotted plug, a hole is bored and the bottom of the block is sawn into to give room to chisel away the space in which the valve works back and front. The pump-tube may be a log bored and inserted into the block (as shown at *e*). Half-inch iron rods may be used to work the plungers. This simple but useful pump requires for its construction only those materials that are available everywhere, and only such skill as is possessed by any village carpenter or mechanic.

Distribution.

An adequate supply of water having been obtained, the preparation of the surface is the next work. For gardens this should be very complete, as the work will be permanent, and the first outlay will be the last, if the work is properly done. The method of laying out the ground will depend greatly upon the nature of the surface. If it is perfectly level, with no perceptible slope in either direction, the method of bedding should be employed. This is done by ploughing the land in ridges of such a width as will be most convenient for the culture carried on. For market gardens where horse cultivation is practised, these beds may be from 20 to 30 feet in width. In smaller gardens in which the hoe is used, and hand labour employed in cultivation, ridges of 10 to 12 feet in width will be found most



Fig. 7. Section of ridges.

convenient. Where the spade is used altogether, and horses are never admitted, the ridges may be made even of less width, the proportions in all these cases depending altogether upon the convenience or the necessity of the cultivator. The system here described applies to each of these cases. The ground is laid out into plots of a convenient size, which run completely across the garden or enclosure in a direction parallel to that of the main water-furrow from which the supply is to be derived. In case the garden consists of 4, 8, or 10 acres, or less or more than either of these quantities, a proper width of these plots would be 210 feet. This size would be the more convenient, as 210 feet is as nearly as can be had in practice the length of the side of a square acre. Besides, this distance is as great as water can be made to run in a furrow in ordinary garden soil, without being all absorbed before it reaches the extremity. Between these plots sufficient spaces will be left for

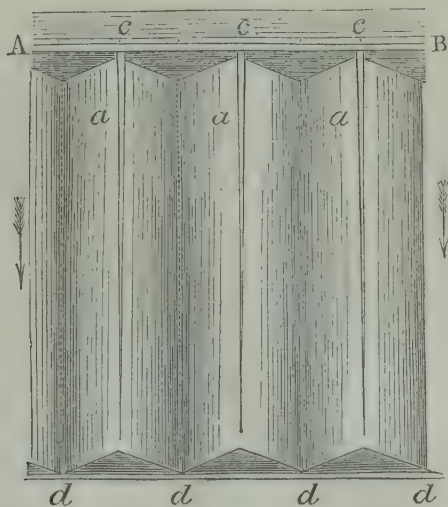


Fig. 8. Plan and section of beds and canals.

roads, if any are needed, for carts or waggons to pass through. These plots are then divided into other plots of the width designed for the ridges. They are then ploughed, and the ridges "twice gathered,"—to use a ploughman's expression—which means that a back furrow is made in the centre of each of these secondary plots, and the furrows are thrown each way towards the back furrow until the ridge is completed. The ground should then be rolled. Then another back furrow is made over the first, and the ridge is ploughed as before, making each of the furrows shallower than the preceding one, so as to leave a gentle slope from the crown of the ridge towards

the open furrow on each side of it. (The ridges then will show an outline, as seen at fig. 7.) At the head of each row of ridges or beds the ground is ploughed into a headland or ridge, which is thrown towards the first made ridges, and which lies at right angles to them, sloping gradually away from them to the fence or



Fig. 9. Section of head-ridge and bed with its canal of supply.

outer boundary of the enclosure, the last furrow made being ploughed deeply so as to provide a ditch for draining the headland. The principal canal of supply for the range of ridges below it will run along the crest of this headland, and a canal of distribution will run along the crest of each of the secondary ridges. Each headland or principal ridge, with its canal, and the range of ridges starting at right angles from it, each one of them having its distributing canal, will then form a system of irrigation independent of the other series



Fig. 10. Section of general arrangement of supply canal.

of ridges. Every seven of these secondary ridges, if they are 30 feet wide and 210 feet long, will occupy 1 acre of ground. At the foot of each series will be needed a draining furrow, unless the ground is underdrained with tile, to carry off the surplus water. A tile drain between each pair of beds or secondary ridges would be the best method of drainage, and the supply of water should be regulated so that the whole is absorbed, and none is allowed to flow away unused. (The series of beds and canals will then appear, as shown in fig. 8, in which three secondary ridges (*a a a*), with the head-ridge (*A B*) and the canals (*c c c*) belonging to each are shown, with the tile-drains (*d d d*). The arrows show the direction in which the water flows. Fig. 9 shows the profile of the ridge and section of the

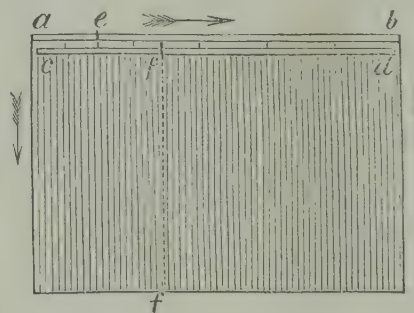


Fig. 11. Plan adopted for hill cultivation.

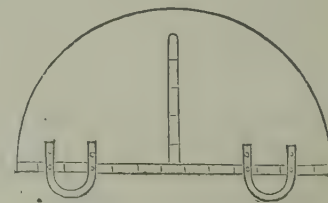


Fig. 12. Wooden gate for closing canals.

head-ridge with its canals of supply as if they were cut down through the centre, *A* being the head-ridge with its canal, *a a* the bed or secondary ridge, *c* the drain at the foot of the bed, and the double dotted lines show the course the tile drain would take below the surface should one be laid. Where the ground has a slope in either direction, the system to be adopted will be much simpler than the preceding one. At the head of the slope will be placed the canal of supply. This will be the only permanent work undertaken. The method of cultivation of the field or garden will control the method of distributing the water. It will be necessary, however, to cultivate the ground in drills or hills, or subordinate beds, upon which the water may be turned when it is needed, leading it by small furrows or canals, made with the hoe or a small hand plough in whatever direction (down or across the slope) may be desired. (Generally the arrangement of the canals of supply will be as shown in fig. 10, in which the supply canal is seen at *a*, and the drain which carries off the surplus water is seen at the foot of the slope at *b*). A low ridge separates the latter from the next supply canal. In this method of irrigation, the water may be supplied as a thin sheet flowing over a smoothed surface, or as a number of small streams flowing in a network of courses over the surface or in regular channels between the drills or rows of plants. The ground may be laid out upon various plans, as the method of cultivation adopted may require. A plan (see fig. 11) adapted for a crop cultivated in hills or drills, each drill forming its own furrow of distribution in which the water may flow, is as follows:—A supply canal (seen at *a b*) is made at the highest part of the ground, with several short canals connecting it with a distributing canal (*c d*). From this distributing canal the water flows into the furrows (shown by the fine lines). The field is watered in sections by closing the canal at

any desired place (as at *e f*) with a sheet-iron plate or wooden gate (shown at fig. 12, in which is seen the gate, and at fig. 13 the method of its use). Obviously by shutting the canal in this manner the irrigation is confined to the portion of the field circumscribed by the closed furrow (shown by the dotted line *ff*, in fig. 11). The direction of the water is shown by that of the arrows. Where the slope of the ground is too abrupt to admit of very long furrows, a different plan (shown in fig. 14) may be adopted. In this the supply canal (seen at *a b*) is the same as previously described. From this the lateral canals (*c c c*) are made, each of which supplies its own dependent furrows, and no more water is admitted to these canals than will water the surface to which it is tributary. These canals gradually decrease in size until they disappear at the boundary of the field or garden. The

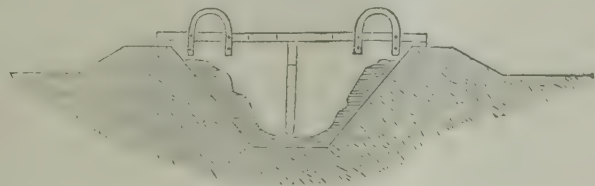


Fig. 13.—Wooden gate in use.

water flowing from these lateral canals takes the direction shown by the arrows. A more elaborate arrangement will be suitable in those cases where a variety of crops, each needing especial treatment, are grown. (Such a one is shown at fig. 15). In this the water is supplied by one or two canals (*a b* and *a c*), as may be consistent with the slope of the ground. A road (*d d*) is laid out at one side of the plot; a portion of the ground (*e e*) being retained for cultivation, leaving room to turn a cart or waggon at each end of it. The water is turned from the main supply canal (*f*) into the main



Fig. 14.—Plan of irrigation where the slope is abrupt.

distributing canal (shown by the double lines). The ground is laid off into plots suitable to the system of culture (as at *G H I J K L*). These may be irrigated in various ways, as, for example, by long furrows (at *G*), in smaller beds with shorter furrows (as at *I*), or in furrows running in an opposite direction (at *K*). The flow of water in the distributing canals is controlled and diverted by means of the hand-gates already described (the arrows show the direction of the

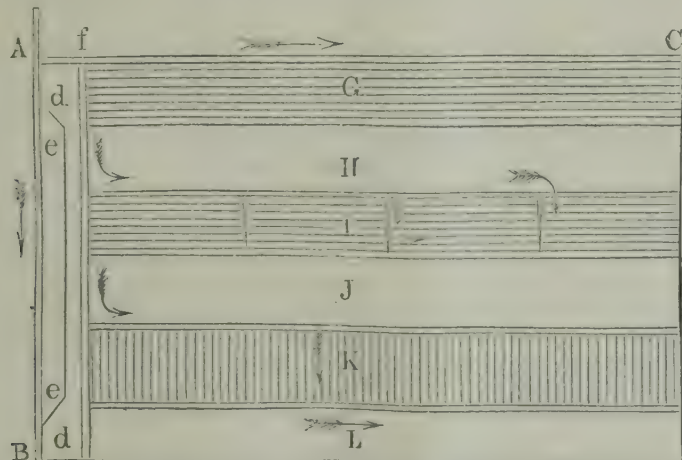


Fig. 15.—Plan of irrigation suitable to market gardens.

various currents). A plan for a garden very completely irrigated by means of a well or reservoir may be laid out as follows (see fig. 16). A road passes through the centre and around the plot. The well and reservoir, windmill or horse-power, is situated at the highest part of the ground (see *A*). From this the water is conveyed by channels to the lower part of the garden. From these channels it is distributed in small furrows to every row of plants or bed of vegetables. (The arrows show the direction of the flow of water.) For a small garden this system is doubtless the most perfect of all methods of irrigation by surface channels and furrows; while for larger ones or market

gardens, in which the supply of water can be procured from wells or carried into reservoirs for final distribution, it is equally perfect.

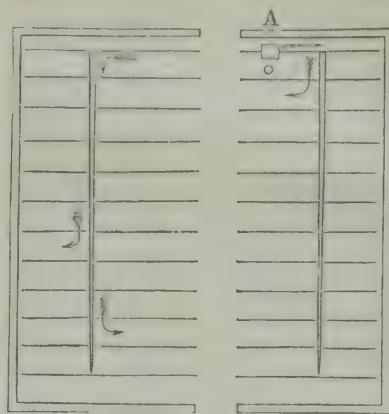


Fig. 16. Plan for irrigating a garden from a well or reservoir.

The form of the channel deserves consideration. The typical canal or furrow (shown at fig. 11) is one in which the earth thrown out forms a bank above the channel, preventing the influx of water from a neighbouring channel, while the lower bank is not raised, and permits the escape of a thin sheet of water over the ground below it. There are many other forms of furrow available which will occur to the practical operator as they may be needed. But there are some methods of strengthening the furrows against degradation by the currents of water worthy of notice.

One of these (shown at fig. 12) consists of a trough of wood, two strips of 4 or 6 inches in width being used. These are nailed together by their edges, and imbedded in the furrow. The water in passing along is prevented from escaping into or from flowing over the soil except at the open side of

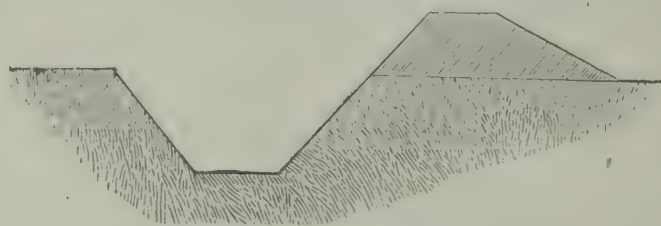


Fig. 17.—Section of typical canal or furrow.

the trough. A portable wooden trough (fig. 13), with cross channels, may be used to convey water over ground that is under cultivation or is not in a condition to be disturbed with the hoe. This trough is peculiarly adapted for use in the system of bedding here described, as it may be laid upon the crest of the head ridge, and the cross channels connected with the furrows upon the crests of the beds. These latter may be made of common open horseshoe drain tiles inverted. The uses to which this kind of drain tiles may be put in



Fig. 18. Method of strengthening furrows against currents of water.

surface irrigation are very numerous, but they will be so obvious to those interested that it is necessary only to suggest their usefulness in this respect.

Garden Irrigation by Pipes and Tiles.

Many elaborate improvements have been made within the past few years in the practice of irrigation. The costly character of these improvements renders them inapplicable to any lands except those upon which the crops are of great value. The minimum value of the crops that may be profitably raised by the methods of irrigation referred to may be placed at £80 per acre. In some cases where the profitable use of land depends entirely upon these costly plans this minimum may be reduced considerably. Thus, rather than have land idle it may pay to expend a permanent capital of £50 per acre, the

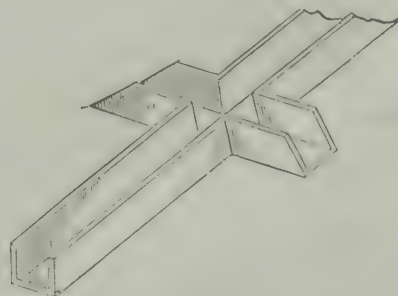


Fig. 19. Portable wooden trough with cross channels.

yearly interest of which, with the annual cost of water and labour, may, on the whole, result in a yearly outlay of £20 per acre to produce crops which may realise £50 to £60 per acre. For a market garden these amounts are much less than the average value of the crops produced, and many seasons occur in which the losses by reason of dry weather at critical periods will amount to far more than the total value of the improvements here to be

described. The simple fact that in many cases the crops which, under favourable circumstances, should have realised £80 to £240 per acre, have been so injured by drought as to fail to pay the cost of production, is sufficient to induce the gardeners and fruit growers

to adopt methods of securing a full crop in spite of the drought. There are many cases in which the methods of surface irrigation previously described are unsuitable. Where the services are irregular, where the crops are changed several times in a season, where the ground is under biennial or perennial crops, and furrows cannot be maintained, or where the ground is too valuable to be occupied by furrows or water channels, these and other conditions will be favourable to the use of one or another of the following described plans. The first to be treated of is that of underground pipes and stationary hydrants, from which water may be distributed under pressure through indiarubber hose and sprinklers. An elevated reservoir is provided, from which an iron pipe having a capacity equal to an inch-and-a-half in area for each acre to be irrigated is carried along the centre of the garden. A 2-inch pipe will be required for 2 acres, a 3-inch one for 4 acres, and a 4-inch one for 8 acres. From this other pipes are carried at right angles 200 feet apart to within 100 feet of the boundary upon each side. The pipes are laid a foot beneath the surface, or so far that they can never be disturbed by the plough. Upon the lateral pipes, which should be at least an inch-and-a-half in diameter, so that the flow shall not be unduly interrupted by friction, upright pipes or hydrants are attached which project at least 3 inches above the surface of the soil. These are about 150 feet apart. They are furnished with valves which operate by means of a square head and a key. Each one is fitted with a cap which screws on or off, and which is attached to the hydrant by a short chain for its preservation. When this cap is unscrewed a section joint affixed to the end of the hose may be screwed in its place. When this apparatus is in operation the water descending from the elevated tank or reservoir passes through the pipes and the hose and escapes with some degree of force, depending upon the height of the head, through a flattened nozzle, which scatters it in a thin sheet or broken shower. With this apparatus one may water copiously 5 acres of ground in a day or night. Each hydrant being the centre of a plot 200 by 150 feet, serves to irrigate, with 100 feet of hose, very nearly three-quarters of an acre of ground. To irrigate 5 acres in ten hours would give an hour-and-a-half to each plot, an amply sufficient time for an active man to get around a plot of 200 by 150 feet. The plan here described is illustrated in the foregoing figure. The well, with reservoir, wind-mill and force-pump, is situated in the centre of the plot to be irrigated at A. From this the pipes (shown by the double lines) are carried as has been described. The points marked upon the lateral pipes show the positions of the hydrants, and the dotted circles around a few of them show the extent to which the hose covers the ground. A plan of sub-soil irrigating by means of drain tiles has been in operation for many years, although a recent patent has been granted in the United States for the invention. The patent refers to perforated tiles. But the common drain tiles will answer every purpose that the perforated pipes can or will. The plan is very simple. It is exactly the reverse of draining by tiles. Large pipes—the size being chosen to suit the system tributary to them—are laid down, a foot beneath the surface, at the highest part of the tract to be irrigated. From these, smaller pipes branch as the secondary channels of supply, and from them 1-inch pipes again branch as distributing channels to the limits of the tract. The water escapes through the joints of the pipes, and rises by capillary attraction or absorption to the surface of the soil. As the water will naturally tend to sink in the soil in a greater measure than it will rise to the surface, the distributing pipes will need to be placed very closely. A distance of from 6 to 8 feet apart will be the greatest that should be allowed. This system has the advantages of cheapness of material, of permanence, and of economy in applying the water. But it possesses the disadvantages of large cost of labour in laying the tiles, and of a very wasteful expenditure of water, a large portion of it escaping downward uselessly to the crop. The trenches in which the tiles are laid may be very cheaply made by ploughing twice or thrice in the same furrow until it is 12 inches deep, and when the tiles are laid most of the earth may be ploughed back into the furrow again. For any sort of favourable result the slope of the ground must be regular, or the arrangement of the tiles must be made with costly exactitude.

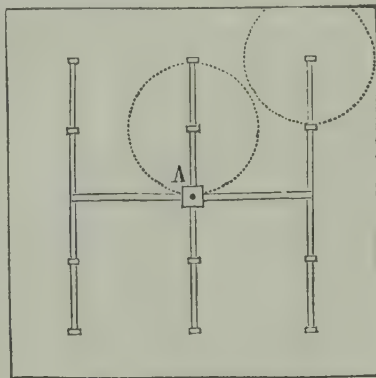


Fig. 20. Plan of irrigation by underground pipes and stationary hydrants.

is fitted with a cap which screws on or off, and which is attached to the hydrant by a short chain for its preservation. When this cap is unscrewed a section joint affixed to the end of the hose may be screwed in its place. When this apparatus is in operation the water descending from the elevated tank or reservoir passes through the pipes and the hose and escapes with some degree of force, depending upon the height of the head, through a flattened nozzle, which scatters it in a thin sheet or broken shower. With this apparatus one may water copiously 5 acres of ground in a day or night. Each hydrant being the centre of a plot 200 by 150 feet, serves to irrigate, with 100 feet of hose, very nearly three-quarters of an acre of ground. To irrigate 5 acres in ten hours would give an hour-and-a-half to each plot, an amply sufficient time for an active man to get around a plot of 200 by 150 feet. The plan here described is illustrated in the foregoing figure. The well, with reservoir, wind-mill and force-pump, is situated in the centre of the plot to be irrigated at A. From this the pipes (shown by the double lines) are carried as has been described. The points marked upon the lateral pipes show the positions of the hydrants, and the dotted circles around a few of them show the extent to which the hose covers the ground. A plan of sub-soil irrigating by means of drain tiles has been in operation for many years, although a recent patent has been granted in the United States for the invention. The patent refers to perforated tiles. But the common drain tiles will answer every purpose that the perforated pipes can or will. The plan is very simple. It is exactly the reverse of draining by tiles. Large pipes—the size being chosen to suit the system tributary to them—are laid down, a foot beneath the surface, at the highest part of the tract to be irrigated. From these, smaller pipes branch as the secondary channels of supply, and from them 1-inch pipes again branch as distributing channels to the limits of the tract. The water escapes through the joints of the pipes, and rises by capillary attraction or absorption to the surface of the soil. As the water will naturally tend to sink in the soil in a greater measure than it will rise to the surface, the distributing pipes will need to be placed very closely. A distance of from 6 to 8 feet apart will be the greatest that should be allowed. This system has the advantages of cheapness of material, of permanence, and of economy in applying the water. But it possesses the disadvantages of large cost of labour in laying the tiles, and of a very wasteful expenditure of water, a large portion of it escaping downward uselessly to the crop. The trenches in which the tiles are laid may be very cheaply made by ploughing twice or thrice in the same furrow until it is 12 inches deep, and when the tiles are laid most of the earth may be ploughed back into the furrow again. For any sort of favourable result the slope of the ground must be regular, or the arrangement of the tiles must be made with costly exactitude.

Liquid Manure.

The ordinary cultivation of gardens exhibits a most striking want of economy. Market gardens, and those smaller ones attached to village

dwelling, ought to be cultivated in accordance with the strictest economy. Not a drop of rain-water ought to be allowed to go to waste. The house-slops should be carefully utilised. The cesspool, the stable, and the refuse heap ought to serve the useful and appropriate purpose of aiding in the production of the household vegetables and fruits. But on the contrary, it is doubtful if they are so utilised completely in any establishment even where the means exist. Partially they have in some few cases been made to serve their proper purpose with the best effects. It is in densely-populated countries that liquid manuring has been brought into use, and these valuable materials made serviceable. Without going so far as China and Japan for examples of this economy, it may be stated that Belgium, the most thickly-peopled country of Europe, offers the nearest and most conspicuous example of the preservation of every kind of animal manure, both solid and liquid, and its manipulation in tanks for the purpose of applying its solution or dilution to gardens and small farms. In many parts there is an arrangement of house drainage, combined with garden irrigation, recently brought into use that has been tested with satisfactory results, and that is full of promise for its future general adoption. This grew out of the successful application of the system of earth closets to some cottages in a village in the county of Essex. The vast superiority of these over the common filthy cess-pools makes more conspicuous than ever the inconvenience, insalubrity, and waste of the usual slop holes where the liquid waste of the house was disposed of. For sanitary purposes a method was devised to dispose of this waste, and for economic purposes a plan of utilising it was adopted. From the sink of the kitchen a pipe furnished with an air-trap (a) was made to discharge into a tank built of cement concrete outside of the wall of the house. (This tank is seen in the figure below, A being the sink in the kitchen with the pipe and trap). The rain-water from

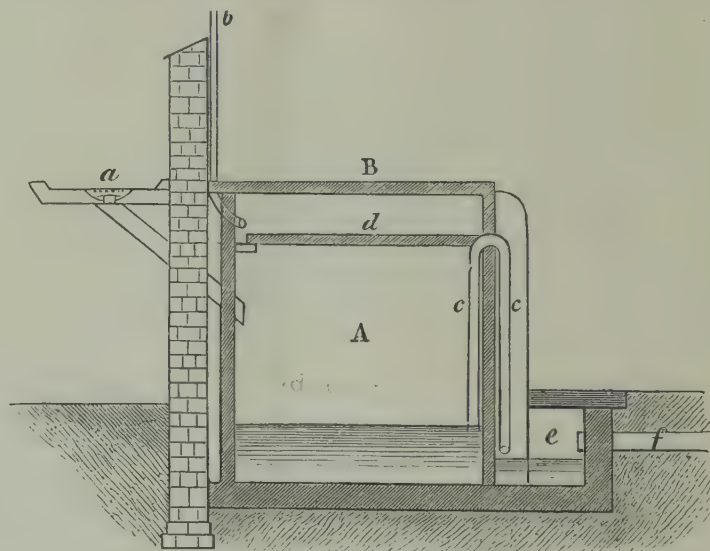


Fig. 21. Self-acting flush tank.

the roof of the house is carried to the tank by a pipe (b) which also serves for ventilation. The tank is simply an underground cistern made water-tight, and lined with hydraulic cement. The overflow from the tank is made intermittent by the ingenious use of a syphon (seen at c c). The operation of this overflow is simple. When the cistern is filled to the moveable cover (d), the water then trickles over the bend of the syphon into the drain (e). When this occurs, the discharge of a pailful of water into the sink, and through the pipe into the tank, suddenly fills the pipe, flushes the syphon, and sets it in operation, and the tank is drained to the level of the shorter leg of the syphon. The contents of the cistern flows away by a pipe (f) which leads from the drain. This tank is called the "self-acting flush tank." The cover (B) is a moveable plank floor which serves to allow access to the tank for any purpose. But this leads to the real subject matter in hand, the irrigation of the garden. By this plan, this can be secured whenever it is desired by simply introducing into the tank water sufficient to set the syphon in operation. The liquid then passes into the drain, and from that into sub-drains of 1-inch drain tiles placed 1 foot beneath the surface, escaping through the joints into the soil. The second figure shows this arrangement. The outer lines represent the boundary of the garden plot, supposed to be an eighth of an acre, or 50 x 100 feet. The tank is seen at d; the dark line proceeding from the tank is the drain; the thinner lines are the irrigating drains; the square dots are inspection wells, covered with a square stone or plank cover, by which examinations are occasionally made as to the condition of the drains, and the parallel lines in the centre are land drains which carry off any excess of moisture. This plan is of very

extended applicability where the land to be irrigated may be beneath the level of the site of the house and the tank, and no house should be built upon a lower level than the ground around it. An improved tank, suitable to dwellings of a somewhat superior character is shown in the concluding figure. The principle is exactly the same as that previously described, the material of the tank being different. It is cylindrical in form, and may be of galvanised iron, of zinc, lead, or wrought iron, or of hard brick laid in cement. The discharge pipe may be of cast iron. This form of tank has been found to work with the greatest ease; two quarts of water suddenly discharged into it when full being sufficient to set the flush into operation. This apparatus consists of the cylindrical tank (a), with a trapped inlet (b), which also forms a moveable cover to give access to the inside of the tank. The pipe from the sink discharges over the grating of the inlet (as shown on the figure). A socket (c) is prepared for a ventilating pipe. There is also the syphon (d), and what is called the "discharging trough" (f), consisting of a small chamber, made to turn round, so that its mouth may be set in the direction that is required for connecting it with the line of outlet pipes (g), and provided with a moveable cover for access to the mouth of the syphon. This "discharging trough" is an important feature in the tank, as it is of a peculiar shape, which, by checking the outflow of the liquid from the mouth of the syphon, enables a smaller quantity of liquid flowing into the tank to fill the bend of the syphon and set it fully in action. The danger of filling up the pipes with sediment would prevent the application of this system to the use of matter from cesspools or barnyard manure tanks. It would not, however, prevent its use for the purpose of discharging a cesspool through a pipe of sufficient diameter—4 to 6 inches, for instance—into a manure tank in the stable-yard, where it could be mingled with the liquid draining from the stables. This tank would then form the cesspool; the overflow from the house tank passing into it would flush and cleanse the latter at every considerable shower. A good supply of liquid matter of the very richest fertilising power would then be at hand for use by means of permanent or temporary irrigation. The liquid would need to be raised from the cistern by a pump worked by wind or

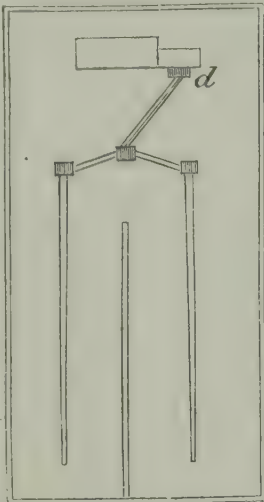


Fig. 22. Plan of irrigating drains from self-acting flush tank.

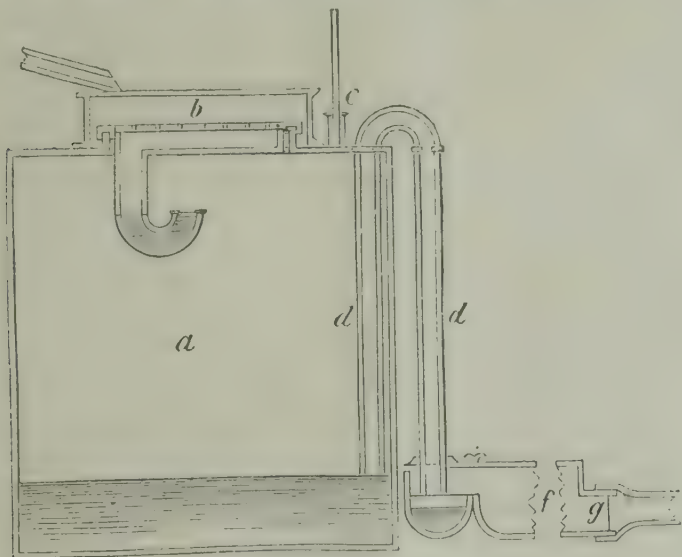


Fig. 23. Improved self-acting flush tank.

horse-power, as has been already described, and conveyed through large pipes into the distributing channels. These could be permanently made of inverted horseshoe tiles, or in any of the methods heretofore mentioned, or temporarily by the use of the hoe. It would be necessary to use caution in largely diluting the liquid manure; a dilution that would run off perfectly clear might be of sufficient strength for all purposes. The danger lies in using it of too great strength rather than in diluting it too copiously. It has been found in practice after a heavy rain had filled the tanks with water at a season when there was but a very small supply of manure on hand, so that the dilution was certainly not less than a hundred times, that the use of this weak liquid, in a succeeding day, gave a stimulus to the crop.

Irrigating Orchards.

In countries liable to suffer from drought the most extraordinary results are obtained in orchards by irrigation. The methods of irri-

gating orchards are very simple. It is necessary only to put the water where it will do the most good, and that is as near as possible to the extremities of the rootlets. The extent of the roots of a tree bears a ratio somewhat approaching that of the branches. Near the stem there are few of the spongioles by which nutriment is absorbed. They are found at the extremities of the very fine rootlets, and these exist in a ring around the tree, the inner side of which is from 3 to 4½ feet distant from the stem. In irrigating an orchard, then, the most perfect method of applying the water is to distribute it in a broad circular channel around the tree distant about 6 feet from the stem. Where irrigation of orchards is practised two different plans are adopted. The first is a somewhat rude method, but is easy and effective. The water is led into a channel between two rows of trees (a b fig. 24), and from thence into distributing canals (c c c) which carry the water within a few feet of each tree. (The position of the trees in the figure is indicated by the dots.) Here a sharp bar is thrust into the ground in several places, penetrating in different directions towards the roots and leaving holes by which the water soaks into the earth and reaches the roots. The second is a more elaborate but a preferable method. The water is led from the canals into circular furrows, which curve so as to embrace the tree. (This is shown at d e in fig. 24.) These furrows are broad and shallow, and the water overflows from them in a thin sheet or a multitude of little rills which lead to the lower side of the tree where they are arrested by means of a slight embankment raised with the hoe. In this case the water is brought exactly where it is needed, and every rootlet is supplied. As a rule irrigation and drainage should go together. Irrigation

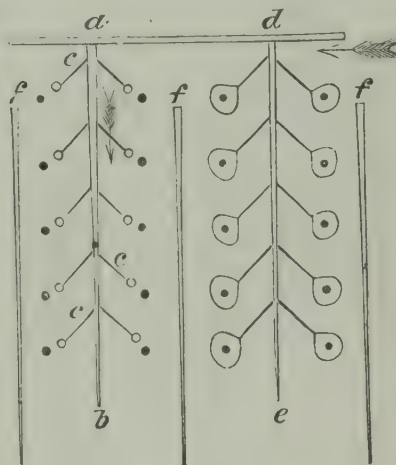


Fig. 24. Irrigating an orchard.

without drainage, in most cases, will convert a tract of land into a morass. Stagnant water is fatal to the life of useful vegetation, and it is here that the causes of the failure of many attempts to irrigate originate. In arid territories without rainfall, skilful irrigation will apply such a quantity as will be needed to supply evaporation from the surface of the soil and the transpiration of the plants. If more is given the surplus must pass off through the sub-soil, or, remaining in, it will work mischief to the crop. But such an excess of water can rarely be procured in arid districts. On the contrary, the greatest economy must be exercised in using the limited supply and waste is impossible. It is otherwise in those parts of the country where partial or periodical irrigation is used. There the water supply may be copious, and the skill of the cultivator is to be exercised in conveying to the ground only so much as may be serviceable and no more. But to hit the just mean is a matter of difficulty. For safety, therefore, in these cases a system of drainage is imperatively needed.

The above valuable article is from the "New York Tribune," the cuts being re-engraved for THE GARDEN. Irrigation, though almost neglected, so far as our gardens are concerned, would be as great an aid to high cultivation in our dry districts as it has long been proved to be in other countries.

The Late Winter.—Mr. Ellacombe has supplied your readers with some valuable notes of the effect of the recent trying winter on out-door plants in Gloucestershire, and he invites similar lists from other places. The following plants of doubtful reputed hardiness have survived without injury on the West Coast of Scotland, viz.:—*Aloysia citriodora*, *Clanthus puniceus*, *Myrtus communis*, on a wall; *Fuchsia* (various hybrid kinds in open border), *Fuchsia Riccartoni*, *Desfontainea spinosa*, *Convolvulus Cneorum*, *Sparaxis pulcherrima*, *Arum crinitum*, *pictum*, and *serotinum*, and *Crinum capense*. The following have died or disappeared, viz.:—*Commelina coelestis*, *Primula mollis*, *Anomatheca cruenta*, *Antholyzas*, and *Eryngium bromeliæ-folium*. Nearly all the plants in a bed of *Verbena venosa*, which had stood the previous two winters wholly without injury, are dead. A bed of seedling Conifers from seed sown last year was left unprotected. It contained young plants of *Pinus insignis*, *Sabiniana*, and *macrocarpa*. Nearly all are dead, except *Pinus insignis*, which is quite healthy. A few young plants, however, of *Pinus Sabiniana* and *monticola* are now appearing from seed which has lain all winter. No established Conifers appear to have suffered here. *Cupressus sempervirens*, although rather browned in the points by the frost and high winds, is now quite green again, and not one of about fifty plants is seriously injured.—SALMONICEPS.

THE FRUIT GARDEN.

PEACH AND NECTARINE CULTURE UNDER GLASS.

THE Peach and Nectarine being very closely related, the same treatment answers for both. A consideration of the first importance is the composition of the border, which in the first place should be well drained, and if any of the sub-soil should be of an unfavourable character, it should be removed to the depth of a foot or so, and a layer of concrete, about 4 inches thick, put in, allowing an inch in a yard of fall from the house to the front of the border, to admit of the water running off into the drain, which must be made along the entire length of the border. Allow the concrete to harden before making the border; put on 7 or 8 inches of broken bricks or stone, cover it over with 2 inches of gravel, or any other material of a finer character, to prevent the soil from working into the drainage, which will now be about level with the top of the ground. All fruit borders should stand above the ground level. The width of the border should be from 12 to 14 feet. It should be 2 feet deep close to the house, running off to 18 inches at front. It is best to make it in separate parts—say, half the width to begin with, and the other half at two different times, as the roots extend. This gives fresh vigour to the trees at a time when they want it, and the border lasts longer. All stone fruit grows to the greatest perfection in strong heavy loam in limestone districts; but, as this is not to be met with in many gardens, good substitutes are to be found in sods of old pasture, which should be stacked up for two or three months before they are wanted. Get a few loads of good shelly marl, lay it in a shed to dry, so that it can be easily chopped with the spade; and, in making the border, chop the sods roughly, first covering the drainage with them, laying the grassy side down. Mix the sods, if light, with one-third of marl; if heavy and strong, mix in some old lime rubbish. It is better not to put any manure in, as this can easily be put on the top when required. Always avoid a light sandy soil, which will make plenty of bloom; but after the first or second year, very few fruits will set. Peaches may be safely planted from October to April; but it is best to plant them as early in October as possible, if the wood is firm and ripe. Every care should be taken in removal not to bruise the roots, which should be stretched to their full length, and covered with about 2 inches of soil, keeping the crown well above the ground, in order that room may be found for a top-dressing at any time. Give a good watering through a rosed can, and damp the foliage over with the syringe two or three times a day, according to the weather. The soil being warm the roots soon begin to grow, and if the trees are large you may have a good crop the ensuing season. The permanent trees should be allowed not less than 16 feet between them, as the fruit is finer, and the trees last longer when plenty of room is given them. Trees can be planted temporarily between them, and removed when their room is required. This is, however, often neglected, which is a mistake. As soon as the buds begin to grow they must have every attention in disbudding; this operation should not be completed all at once, but on several occasions. First, remove those buds on the front of the shoots that are misplaced, and in a week or ten days, go over them a second time, leaving the best placed and most promising shoots nearest the base. This is important to keep the tree furnished; in the course of another week or so go over them a third time, making a final choice for next season's fruiting, always leaving a shoot beyond the fruit, and watch any rank shoots that appear likely to take a lead; it is generally best to cut them out at first if they can possibly be spared, as they rob the other part of the tree. Be careful to balance the growth, so that one side of the tree does not outgrow the other. The ordinary fan system of training is best for general purposes. As soon as all the fruit is gathered, go over the trees and cut out all the useless shoots where the fruit has been, and leave nothing but what is required for fruiting the next season, thus concentrating the energies of the tree, and giving light and air to mature the whole length of the shoot, which assists in laying a good foundation for the next crop. If the superfluous shoots are not taken out, many of those that remain get badly ripened and, as a matter of course, produce few blooms the following season.

With regard to temperature, they should be shut up every afternoon when the thermometer is down to 80°, syringing every part of the tree freely to keep down red spider, and promote a genial growing atmosphere. At dusk admit air by the top ventilators, and leave it on all night, if the state of the weather renders it necessary. If it be very hot, give plenty of air as early as possible. This will give substance to the foliage and quality to the fruit, and will prevent both mildew and red spider to a great extent. A close damp atmosphere in the night, and a roasting in the morning before the ventilators are opened, injure both the foliage and fruit, and often cause many fruit to drop off prematurely. When the wood is well ripened, there are generally more fruit set than are wanted; these must be thinned—not all at once, but at intervals. When the fruit sets in clusters, remove all but the largest ones and those that are near the wires or behind the shoots. When they have attained the size of a large marble, go over them a second time, removing all the smallest fruit, leaving them thickest where the shoots are strongest; but discretion must be used in making choice of those that are to remain, according to the strength of the tree. The third thinning should not take place till the fruit are stoned; but, if they are thinned out two to a square foot at the second thinning, very few will fall in stoning; and, where fine fruit is the object, a few of those may be thinned as soon as stoned. As regards watering outside borders, much depends on the character of the weather and the nature of the soil; but, where the borders are inside, three or four waterings are sufficient, where the syringe is freely used—a thorough watering when the house is about to be started, another after the fruit is set, and a third as soon as the fruit is stoned. If the soil is not of a calcareous nature, give a few canfuls of clear lime-water, watering afterwards with clean water. It is a bad practice to allow the border to become dust-dry in the winter; it weakens the buds, and the blooms that do not fall never get larger than a Marrow-fat Pea.

JAMES SMITH.

Waterdale, St. Helens.

GUANO FOR FRUIT TREES.

A GOOD many years have passed away since I first used guano as a top-dressing for Vine borders, with very marked results, and since that time I have often used it, both in the shape of liquid manure and sprinkled over the borders, not only in the case of Vines, but also that of Peaches, Figs, Cherries, Plums, and other fruit trees, both indoors and in the open air, whenever I considered it necessary to assist a heavily-laden tree to finish off its crops without undue exhaustion. In a season like the present when, to judge from appearances, fruit crops in all parts of the country are likely to be much above the average, the question assumes an importance that would not be accorded to it when crops are scanty. Many of the evils resulting from over-cropping in an exceptionally fruitful season might be obviated by judicious feeding—not with solid manures, but with liquid stimulants. I feel confident that in gardens where, as a rule, the manure supply is never too large, a more extended use of what are commonly known as “artificial manures” would be attended with the most beneficial results. Peruvian guano is undoubtedly one of the best fertilisers to employ, where the object sought is to enable a tree to get over a difficult season without impairing its constitution. It is quick in its action, can be given just when it is required, and does not clog up the pores of the soil; but, of course, in no case should it be used, unless the state of the trees clearly denotes that some extra assistance is wanted. The age, strength, and condition of the trees, in fixing the quantity that may be applied, should also be considered. Generally speaking, about half-a-pound to each square yard of surface should be sprinkled round the tree, nearly as far as the roots are supposed to extend. I have often used guano in much larger quantities than I am now recommending, but its qualities vary, although not so much as many other artificial manures, and it is best, until experience has been gained, to err, if at all, on the safe side. I would rather always give two light dressings than one heavy one. In all cases, when sprinkled over the borders, the operation should be followed immediately with a good soaking of rain or pond water, unless the weather happens to be wet. A good deal of misapprehension seems to exist as to the meaning of the term “a good soaking of water;” it often happens that half-a-dozen potfuls poured round the trunk of a good sized tree is called a good soaking, when, in reality, it has only just moistened the surface. The truth is, in a dry season, in a

well-drained border, until the fruit begins to ripen, the only limit to the application of water should be the power to apply it, as it is next to impossible, in most cases, to over-water. The soil should be thoroughly saturated, if possible, down to the lower roots; and, if the borders are mulched, a fortnight may elapse before another application becomes necessary, unless the weather should be unexceptionally hot and dry.

E. HOBDAV.

Ramsey Abbey.

TOADS AND THE GOOSEBERRY GRUB.

MUCH has been written about the Gooseberry grub, and much also about the toad; but I am by no means sure that the two creatures have ever been linked together in the columns of your paper. They certainly seem an ill-assorted pair, an incongruous couple; yet some good may possibly result from the association. I recollect that, in the year 1848, a Mr. Leadbitter, of Gray's-inn Road, sent me a circumstantial account of the doings of a toad with the Gooseberry grub, an account that rivetted my attention at the time, and the impression of which remains sharp and clear on my memory after a lapse of twenty-seven years. The facts of the case were recorded at the time, and have been abundantly verified by subsequent observations of my own; here they are, as narrated by Mr. Leadbitter. This gentleman was staying near Dorking, and observed that three or four Currant bushes nailed against a garden wall were striped of their leaves by these ubiquitous garden pests, which were swarming all over the bare twigs and clinging to stumps of the leaf-stalks, the only indication remaining of leaves having once grown there. A few wretched bushes of Currants sufficed to show what the shrub desired to produce had the grubs permitted. Squatting on the bare earth, in the angle of the garden wall, was a corpulent toad waiting for "something to turn up," or, perhaps, speaking by the card, for "something to come down." The happy thought at once occurred to Mr. Leadbitter, that this "something" must be a Gooseberry grub, so he collected a quantity of these grubs, and readily induced one of them to crawl on the end of a short stick; this feat having been safely accomplished, he next presented the grub to the toad, who contemplated the dainty for a few seconds, with his head held knowingly on one side, and his eyes beaming with satisfaction. After a very short pause, the grub began to crawl up the stick, doubtless deluded by the notion that he was ascending into a region of Currant leaves. Then there was a movement of the toad's head and neck, and in an instant, in the twinkling of an eye, the grub was gone; he had descended alive into a living tomb—the stomach of the toad. The naturalist then continued to supply the toad with his living diet until his collection of grubs was exhausted. On the following afternoon, and so on day after day, Mr. Leadbitter and the toad repaired to the same feeding-place, until no more grubs could be found, and the toad had to go without his accustomed meal. At this he was so disappointed or affronted, that he returned no more to the feeding-place. The process of eating, as observed then by Mr. Leadbitter, previously by Mr. Bell, and subsequently by myself, is this:—The tongue of the toad is thrown forward, so as to touch the grub, and then as quickly withdrawn—the grub adhering to its extremity—and so swallowed. The whole process is inconceivably rapid—so much so, indeed, that only a practised observer would be aware of what had taken place. Being induced to pay great attention to the feeding of toads by what I had read, I believe I can positively assert that these most useful reptiles always require living food, and always wait for the object, be it what it may, to move before seizing it. I have never been able to induce a toad to seize a dead grub, or a dead fly, or motionless food of any kind, so that I feel very sceptical as to the truth of those amusing anecdotes of feeding tame toads on bread and milk, and other succulent preparations congenial to infant stomachs. Such stories have long received implicit credence amongst us; they have even been transplanted to American soil and have returned to us slightly altered, the harmless toad being transmuted into a venomous black snake, and a child represented as feeding him on bread and milk with a silver spoon. The season is now approaching for Gooseberry grubs to make their annual visit, and I wish to repeat what I have stated over and over again, that I have never found any remedy for their ravages. I utterly repudiate as worthless all chemical preparations of any kind, except whitewash. I cannot, indeed, doubt the efficacy of whitewash, but I question whether the cure is not worse than the disease. Then we come to the consideration of the toad remedy. I am perfectly willing to admit that this has also its difficulties, but I think these are not insuperable. In the first place, if you collect toads in a walled garden, they must of necessity remain there for a time; in the second place, if you shake the Gooseberry bushes of an evening the grubs must needs fall, and the toads will be sure to devour them, one at a time, as soon as they begin to crawl. The Gooseberry grub

always enters the ground before it can undergo its transformation. If the earth beneath the Gooseberry bush be trampled hard, it is difficult for the grubs to force their way beneath the surface, and, therefore, they wander about, exposed to birds by day and toads by night; thousands also fall a prey to carnivorous ground beetles, which seem to subsist entirely on night-walking worms and caterpillars. It is a noteworthy fact that very few birds have any weakness for the flavour of a Gooseberry grub; two only are known to me, the cuckoo and the redstart. I must by no means be understood as enunciating any rule on this subject, or even as saying that Nature imposes a positive law on her birds; but, as I keep a good many of our common species in rather a capacious cage, I have abundant opportunity of testing their tastes in this matter, and I never could detect any species in the act of eating one of these grubs. On the other hand, I have already published the fact that cuckoos and redstarts devour them with avidity; but how to induce these summer visitors to come into one's garden is a problem that I have never been able to solve.

And here I may just hint that the well-known song of the cuckoo, and the equally familiar white forehead of the redstart, always precede the advent of this enemy of the gardener—an enemy that invariably remains to annoy us until both cuckoo and redstart have taken their departure; then he buries himself, with the motto "I shall arise again," as it were, on his lips—a prophetic promise which he is certain to perform to the very letter when the cuckoo returns next year. A word as to hardening the surface of the soil. I believe it a great error in the gardener to make any rule too absolute on this subject. There is little doubt that hardening the surface sometimes interferes with the free growth of plants. As this is probably the case, I shall make no attempt to raise the question; but I have yet to learn that the free growth of a Gooseberry bush is essential to its fruit-bearing capabilities. Indeed, I have often thought that rapid and luxuriant growth was antagonistic to fruit-bearing; and, if this be so, the hardening of the surface-soil, by preventing too luxuriant growth, is likely to be beneficial rather than injurious. I think we are all too much inclined to make gardening laws of too general application, and thus to argue that, because the lightest possible surface is desirable in the cultivation of tender annuals, it must also promote the fruit-bearing of Gooseberry and Currant bushes. This reasoning will not hold good. Nature has created one insect enemy of the Gooseberry grub, a species of *Chrysopa*, or lace-winged fly. There may be others; indeed, it is most probable there are others, but I have not detected them. This enemy is of very beautiful appearance, but of very disagreeable scent; it has four wings of exactly similar size and character, delicately reticulated like gauze, a green body and head, and two brilliant golden eyes. So far it is a loveable and an attractive creature; but, when you touch it, when you take it up to admire, then it emphatically protests against the proceeding, and, in order to ensure obedience to its protests of touch-me-not, emits such an insufferable disgusting smell, that you are glad to get rid of it, and literally to wash your hands of so offensive a creature. In my life history of plant lice, published in the "Field" of Sept. 30, 1871, I gave a figure of this "lace-wing," together with its eggs and larvæ. I there mentioned two other names by which it is well known to entomologists, "golden-eye" and "aphis-lion"—names that show how well it is known, and how correctly one of its habits has been observed. Well, this fly hovers lazily about the Currant or Gooseberry bushes, wherever she observes the parent flies laying their eggs. After a short survey, she selects a particular leaf, the veins of which, so prominent on the under side, have just been beaded with the oblong eggs of the Gooseberry grub; then, feeling perfectly satisfied that there is abundant promise of provender for her future family, she proceeds to the very edge of the leaf, and, discharging a drop of glue, lifts up her body, and the glue, being pulled out to the length of half-an-inch or more, is thus formed into a thread, which immediately hardens and becomes a stiff and permanent bristle; at the extremity of this she affixes an egg, and then repeats the process, until there are six or eight of these eggs standing side by side, each on the top of a long bristle. I need not again describe how the little grub in due time breaks its egg-shell, and emerges from its prison-house in the form of a very minute lizard, with six legs instead of four, a distinct head and neck, and a pair of curved and sharp-pointed jaws. These jaws, although wide apart at the base, yet by means of their curved form meet at the tips, and thus constitute a pair of most formidable and effective pincers for worrying the little Gooseberry grubs, which make their first appearance on the stage of life about the same time. Then follows a repetition of the old story of the young wolf-cubs and the lambs—at first they play together in frolicsome harmony; but, as soon as the wolves begin to feel hungry, they eat up their playfellows. It is thus with the young of the lace-wings and the Goose-

berry grubs—at first it is all serenity, a state of peace; but both very soon get hungry, and then the grubs devour the Gooseberry leaves, and the lizard-like larvæ of the lace-wings devour the grubs; a scene of carnage ensues—a regular “massacre of the innocents.” My tale is utilitarian. If you would protect your Gooseberry and Currants from the grub, first bring toads into your garden—toads of all sizes, big and little; secondly, tread the earth hard under the bushes; and, thirdly, never kill a lace-winged fly.

York Grove, Peckham. EDWARD NEWMAN, in “Field.”

[Strawberries on Railway Embankments.]—I had the pleasure of seeing perhaps half an acre of these the other day on a railway embankment. They were planted thickly and broadcast, the whole ground being covered with them; and they were loaded with bloom. Perhaps this is the best way of growing Strawberries on railway embankments, as the whole ground is thus covered with them; and the fierce sunshine, though intensified by the slope of the ground, cannot burn the roots. Could the sewage of villages or towns but be made to trickle down these slopes beneath the foliage, what magnificent fruit might be gathered by the ton from such places. With a slight admixture of soil, and a fair supply of sewage or clean water, all things are possible in the way of fruit-growing on the sides of railway embankments; and as a sign-post to point the way, and an example which is worth a thousand arguments, the Strawberries just alluded to, seen on the North-western Railway, deserve a passing notice.—D. T. FISH.

Apple-blossom Maggot.—I have sent you some Apple-blossoms, at the base of each bunch of which you will find a small red maggot which, in some instances, has worked down into the wood. Nearly all my young trees have been attacked by this maggot, and most of the bunches of them are entirely destroyed. One tree in particular, which was covered with bloom a short time since, now presents nothing but a mass of withered and decaying petals. I fear my whole crop of Apples is gone, and, what is worse, that the growth of the young wood will be prevented. In some instances the maggot has attacked the ends of the young shoots as well as the flowers. Can you inform me if this pest is common in gardens, and if there is any remedy for it? I never saw it before.—AMATEUR, Warrington. [The insect in question is a small moth, named *Laverna vinolentella*. Mr. Stainton, who knows this tribe of insects better than anyone else, informs us that he never met with it himself until two years ago, but Mr. Gregson had previously observed it, and had detected the larva in the bud as early as February and March. It is more difficult to suggest a remedy.—A. M.]

A Place of Figs.—It would be hazarding little to say that the Fig tree is the main prop and support of Smyrna, and that its fruit, fresh or dried, furnishes the chief pabulum of her people's prosperity. The Fig, in every phase, from imperfect to perfect ripeness, “with jacket on,” or smothered in sugar, or neatly packed in drums for exportation (in which labour most of the adult population seems employed), meets the eye everywhere. Without entering into statistical details unsuited to this notice, suffice it to say that this peculiar industry gives constant and profitable employment to thousands of the population, and it is literally “by their fruits” that we know the Smyrniotes. This really constitutes the chief trade of this bustling and busy little city, netting a royal revenue annually for “Giaour” Ismir from the remote infidel on the banks of the Thames or Hudson.—T.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Dew-like Drops on Vine Leaves.—“S.” may consider the dew-like drops which hang upon his Vines in the morning a sign of vigour and health. The reason he does not see them in his other Vineries is, probably, because they are kept at a higher night temperature. If he gives air early in the morning, gradually increasing the amount as the temperature rises, he will find that the dew drops evaporate gradually without causing any damage whatever.—J. S. W.

Varieties of Damsons.—A neighbour, who now and then pays a visit to my orchard, tells me that my Damsons are not of the right sort. Is there more than one kind?—J. B. [There are several sorts of Damson with black fruit cultivated in England, such as the Common Black, with smooth spiny branches; Royal Damson, similar to the Prune Damson, but said to be larger; and the Shropshire Damson, with smooth branches, but not spiny. These are much alike in figure, but they differ a little in size, and possess different degrees of merit. This latter quality, however, depends upon the manner in which the tree has been propagated, the soil and situation in which it grows, and the health and vigour of the tree itself. Damsons raised from suckers and planted in hedge-rows, or grown among Nut bushes, or crowded among and under other trees, can never be expected to produce such fine, thick-fleshed, high-flavoured fruit as those which are grown upon sound healthy standards, in proper situations, unencumbered with coarse strong-growing trees.]

HECKFIELD.

ON the northern border of Hampshire, close to the parish of Eversley, now linked in men's minds with the name of Charles Kingsley, stands Heckfield, the seat of Viscount Eversley, one of those places the gardens of which are interesting to every horticulturist. Heckfield, though not so large as its neighbouring estates, Bearwood or Strathfieldsaye, nevertheless possesses certain characteristics that render it specially noteworthy; and, among these, one of the most important is its beautiful terrace-garden, in which modern flower gardening is well and skilfully carried out. It bears, also, a great name as a fruit-producing place; its grounds, which are well wooded and finely undulated, contain pretty lakes, noble trees, and extensive and well-kept lawns, here and there ornamented with clumps of Rhododendrons and other choice shrubs. On the east side of the terrace-garden the beds are arranged in separate blocks, in the centre of each of which is a large vase; whilst, on the north side, is a double line of pattern beds, and large raised oval ones in the centre. These raised beds and vases are, in summer, masses of floral beauty; whilst the rest are what are termed carpet beds, in which succulents in great variety are used, and many plants not commonly found in flower beds. In winter ornamental shrubs are substituted for flowering plants, and these, together with some of the hardier kinds of succulents, maintain a certain amount of freshness all through the dull season, and even on to the end of March, when they are removed to their summer quarters. In the neighbourhood of the lakes sub-tropical gardening is carried on to a small extent, and with successful results, that style of planting being better suited for such situations than trimly-kept beds, such as those just described. The Douglas Fir and other Coniferous trees thrive well at Heckfield, which, in a few years will possess many grand specimens of that class of evergreen vegetation. At the eastern extremity of the terrace-garden are two notable examples of the hardy Palm (*Chamærops Fortunei*), each about 9 feet in height, and as much in diameter. These were planted out about ten years ago; and, although they have had no protection, are in perfect health, and are even, as Mr. Wildsmith informs us, bearing fruit—that is, one of them, for the other is a male. From seeds thus produced in former years young plants have been successfully raised. Heckfield has always been famous for the production of Grapes, eight large houses being devoted to their culture; three are filled with Peaches, and from these are annually taken splendid crops of fruit. The Grapes in the earliest house are ready for cutting about the end of April, before the supply of Lady Downes in the fruit room is exhausted; and thus Grapes are fit for table here all the year round. The house in which these late Grapes are grown presents a fine sight in October, when they are fully ripe, and hanging thickly all over it. It is span roofed, and the rods are carried right over the entire span, which is some 30 feet in width. Some of the finest and best-furnished bunches of Lady Downes, perhaps ever seen, were cut from this house last year. In order to secure that perfect maturity which is held to be so essential to the proper wintering of this fine late Grape, additional heat power has just been placed in the house. The Grape room forms quite a feature at Heckfield, 2,000 bunches being capable of being stored in it at once, and kept in perfection often for four or five months at a time. All that is required is a dry temperature and an occasional inspection to ascertain whether or not all is going on properly. The borders and walls of the kitchen garden are well stocked with healthy trees. The Peaches especially are in excellent condition, and promise to produce abundant crops. Their blossoms are protected by means of a thin unbleached hemp covering, attached to rollers, as at Frogmore, and, being in long lengths, when let down it forms a close and efficient covering, and one which is very durable. The trees are dressed yearly with the usual mixture of soot, soft soap, tobacco-water, and lime, an application which can be made of a lighter or darker tint by adding a little more or less soot. Early Potatoes and Asparagus are forced in brick pits on beds of 2 feet deep of leaves put in dry; for surface-heat 2-inch pipes are employed. Although no dung is mixed with the leaves they soon generate sufficient warmth.



VIEW IN THE GARDENS AT HECKFIELD.

THE FLOWER GARDEN.

SPRING-FLOWERING PLANTS.*

By JAMES M'NAB, Royal Botanic Gardens, Edinburgh.

THE month of April has been remarkable for a long continuance of dry easterly winds, with a hot sun prevailing during the day. On seven mornings only was the thermometer below the freezing point, the lowest markings being on the 13th, 14th, 19th, 20th, 22nd, and 24th of the month, when 28°, 31°, 29°, 30°, 25°, and 30° were respectively indicated. The highest morning temperatures were on the 1st, 2nd, 25th, 27th, 28th, and 29th, when 43°, 43°, 43°, 44°, 43° and 48° were shown. I have stated that April has been exceedingly dry—only at the beginning and towards the end of the month were slight showers experienced; but none of them were of that warm and genial nature characteristic of April. Up to the 15th arborescent vegetation was considerably behind, but it advanced rapidly after that date, evidently hastened by the strong sun-heat which prevailed, and the moisture existing in the ground from the quantity of melted snow which must have been absorbed during the past winter. On the 1st of May, 1874, vegetation was in advance of many former years; while, on the 1st of the present month, vegetation did not appear to be more than ten days behind that of last year, and, therefore, it is now fully up to an average season. On the 1st of May, Apples, Pears, Plums, Geans, the perfumed and double-flowering Cherries, were in perfection; many expanded flowers were also seen on the Horse Chestnuts and Lilacs, particularly in warm sheltered situations. The Hawthorn (*Cratægus oxyacantha*), although in flower on the 1st of May last year, did not open its first flowers on the same tree before the 10th inst. Appended is a list of the open-air herbaceous and Alpine plants, chiefly flowered on the rock-garden during the month of April, and arranged in the order in which they came into bloom. The past winter has been particularly favourable for such an arrangement, as it gives the precise succession more correctly than could possibly be obtained during a season when plants have not been so thoroughly rested as they were during the late winter. After a mild season, a correct succession could not be so much depended on, as many plants are often in a growing state during the late autumn or winter months. On the 31st of April, about 250 species and varieties were counted in bloom on the rock-garden. The list appended does not include all these, as numerous species and varieties of the genera *Narcissus*, *Saxifraga*, *Aubrietia*, *Primula*, *Alchemilla*, and *Carex*, besides many of a minor description, possessing comparatively little interest, as regards either flower or foliage, are necessarily omitted, as well as varieties which come into flower at the same time as the typical species. The list contains the remaining species of the thirty kinds selected for annually recording their periods of blooming, and which have been mixed up with the general list since the beginning of the year, although several were not grown on the rock-garden. The last plant of the selected series is the Crown Imperial (*Fritillaria imperialis*); it came into flower on the 18th of April, while last year it was in bloom on the 22nd of March, showing that in the case of this plant we were at that date (18th April) twenty-six days behind its time of flowering last year. My object this year for deviating from the ordinary selected thirty species, beginning with the Snowdrop and ending with the Crown Imperial, was chiefly to afford information to those amateur cultivators of Alpine and rock plants, who wish to grow a succession of plants so as to have some of them in bloom during every month in the year. It will, therefore, be my endeavour to make this list, and the dates of flowering, as correct as possible, confining my observations chiefly to plants of general interest. In my previous reports, I alluded to several Coniferous trees, as being very much browned from the effects of the late winter frosts, and the hot sunny days which were so prevalent afterwards. This browning is now showing very distinctly on several other kinds, such as the *Taxodium sempervirens*, *Abies Hookeriana*, and on many species of the genus *Pinus*, particularly the *P. Lambertiana*, *P. Strobus*, *P. excelsa*, *P. tuberculata*, *P. monticola*, and on many plants of

the Scotch Fir, *P. sylvestris*. It is remarkable to observe the common *Laurustinus*, now covered with flowers, the frost of last winter apparently having had no bad effects upon it. During some past winters, when the frost was less severe, including the winter of 1860-61, *Laurustinus* were entirely destroyed. Their preservation last winter may be accounted for by the wood being more thoroughly ripened during the previous autumn than usual.

Plants in Bloom in April, 1875.

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|---|---|
| 1. <i>Narcissus Pseudo-Narcissus</i> | 18. <i>Fritillaria imperialis</i> |
| „ <i>Primula villosa</i> | „ <i>Saxifraga pennsylvanica</i> |
| „ <i>Primula minima</i> | „ <i>Erica hibernica stricta</i> |
| 2. <i>Adoxa moschatellina</i> | 19. <i>Adonis pyrenaica</i> |
| „ <i>Helleborus colchicus</i> | „ <i>Primula denticulata</i> |
| „ <i>Soldanella montana</i> | „ <i>Primula Dinyana</i> |
| 3. <i>Anemone apennina</i> | „ <i>Mahonia glumacea</i> |
| „ <i>Primula ciliata purpurata</i> | 20. <i>Aretia Vitaliana</i> |
| „ <i>Pulsatilla bracteata</i> | „ <i>Draba Androsace</i> |
| „ <i>Pulsatilla vernalis</i> | „ <i>Erythronium giganteum</i> |
| 4. <i>Anemone Robinsoniana</i> | „ <i>Gentiana verna</i> |
| „ <i>Dentaria macrophylla</i> | „ <i>Globularia nudicaulis</i> |
| 5. <i>Narcissus bicolor</i> | „ <i>Jeffersonia diphylla</i> |
| „ <i>Helleborus argutifolius</i> | „ <i>Potentilla nivea</i> |
| „ <i>Rhododendron anthopogon</i> | „ <i>Saxifraga caespitosa laxa</i> |
| 6. <i>Androsace Lagerii</i> | „ <i>Bryanthus erectus</i> |
| „ <i>Muscari racemosum</i> | „ <i>Erica hibernica intermedia</i> |
| „ <i>Narcissus moschatus</i> | 21. <i>Erythronium giganteum roseum</i> |
| 7. <i>Aubrietia Hendersonii</i> | „ <i>Iris verna</i> |
| „ <i>Hutchinsia alpina</i> | „ <i>Primula pedemontana</i> |
| „ <i>Saxifraga diapensioides</i> | „ <i>Ranunculus amplexicaulis</i> |
| „ <i>Gaultheria procumbens</i> (American variety) | „ <i>Saxifraga Rhei</i> |
| 8. <i>Arabis blepharophylla</i> | „ <i>Sedum thymifolium</i> |
| „ <i>Cardamine bellidifolia</i> | 22. <i>Anemone nemerosa bracteata</i> |
| „ <i>Petrocallis pyrenaica</i> | „ <i>Ranunculus gramineus</i> |
| „ <i>Pachysandra procumbens</i> | „ <i>Scilla verna</i> |
| „ <i>Schivereckia podolica</i> | 23. <i>Draba rupestris</i> |
| „ <i>Andromeda tetragona</i> | „ <i>Primula ciliata</i> |
| „ <i>Erica sordida</i> | „ <i>Primula cortusoides</i> |
| „ <i>Erica hibernica alba</i> | „ <i>Phlox setacea violacea</i> |
| 9. <i>Anemone nemerosa fl. pleno</i> | „ <i>Salix retusa</i> |
| 10. <i>Primula Allionii</i> | „ <i>Sieversia triflora</i> |
| „ <i>Erica hibernica stricta</i> | „ <i>Fritillaria Meleagris</i> |
| 11. <i>Andromeda polifolia</i> | 24. <i>Ajuga pyramidalis</i> |
| 12. <i>Aubrietia deltoidea</i> | „ <i>Saxifraga Wilcommiana</i> |
| 13. <i>Androsace coronopifolia</i> | „ <i>Rhododendron glaucum</i> |
| „ <i>Coptis trifoliata</i> | „ <i>Rhodora canadensis</i> |
| „ <i>Lithospermum fruticosum</i> | 25. <i>Alyssum montanum</i> |
| 14. <i>Erythronium americanum</i> | „ <i>Berberis Darwinii</i> |
| „ <i>Trollius pallidus</i> | „ <i>Phlox aristata</i> |
| „ <i>Ornithogalum exscapum</i> | „ <i>Primula involucrata</i> |
| „ <i>Polygala Chamæbuxus</i> | „ <i>Primula longiflora</i> |
| 15. <i>Draba altaica</i> | „ <i>Azalea procumbens</i> (American variety) |
| „ <i>Sanguinaria canadensis</i> | „ <i>Menziesia empetriformis</i> |
| „ <i>Menziesia coerulea</i> | 26. <i>Anemone trifoliata</i> |
| „ <i>Rhododendron ciliatum</i> | „ <i>Bellis rotundifolia violacea</i> |
| 16. <i>Anemone pulsatilla</i> | „ <i>Draba gigas</i> |
| „ <i>Aubrietia conspicua</i> | „ <i>Trichonema rosea</i> |
| „ <i>Dodecatheon integrifolium</i> | 27. <i>Primula scotica</i> |
| „ <i>Iberidella rotundifolia</i> | „ <i>Pyxidantha barbulata</i> |
| „ <i>Myosotis dissitiflora</i> | „ <i>Saxifraga aretioides</i> |
| „ <i>Podophyllum Emodi</i> | 28. <i>Colurna laxiflora</i> |
| „ <i>Saxifraga Maylii</i> | „ <i>Erysimum helveticum</i> |
| „ <i>Trillium grandiflorum</i> | „ <i>Salix reticulata</i> |
| „ <i>Rhododendron Chamæcistus</i> | 29. <i>Helonias bullata</i> |
| 17. <i>Andromeda fastigiata</i> | „ <i>Primula japonica</i> |
| „ <i>Erica hibernica minor</i> | „ <i>Azalea procumbens</i> (Scotch variety) |
| 18. <i>Androsace carnea eximia</i> | „ <i>Menziesia Drummondii</i> |
| „ <i>Asarum canadense</i> | 30. <i>Convallaria majalis major</i> |
| „ <i>Aubrietia Campbellii</i> | „ <i>Primula cortusoides amoena</i> |
| „ <i>Comaropsis fragarioides</i> | „ <i>Saxifraga calyciflora</i> |
| „ <i>Claytonia virginica</i> | |

ROCK PLANTS AT HEATHERBANK, WEYBRIDGE.

MR M'NAB's interesting account of the Edinburgh rock-garden, and "Salmoniceps's" remarks, have induced me to send you a few notes on our rock and root-gardens at Heatherbank. In the root-work are three plants of *Azalea mollis*, from Van Houtte, rose-buff, buff-rose, and orange-buff, each with from twenty to forty large clusters of flowers, which are individually much larger than those of the old Ghent Azaleas. We have also *Andromeda angustifolia*, with its white flowers clustered along the stem; *Linnaea borealis*, with its dense masses of delicate young green leaves and pretty little trumpet flowers; *Gaultheria procumbens*, which seems perfectly happy when forcing its growth between the bark and wood of the stumps, and, thus circumstanced, produces berries of unusual size and brilliancy.

* Read before the Botanical Society of Edinburgh, May 13, 1875.

In a cave on the north side a great clump of the Oak Fern looks as beautiful as it did in its Highland home, whence I brought it. In the rock-garden we have the *Erythronium giganteum*, with four large flowers on a stem, and in colour a beautiful pale primrose with bright yellow centre; *Cypripedium pubescens*, *C. arietinum*, small, but very pretty; *C. japonicum*, about to open; strong heads of *C. spectabile*; and some others of the Lady's-slipper family, not showing bud yet. *Aquilegia glandulosa*, from Forbes seed, is now in great beauty, as are also *Trollius asiaticus*, *Narcissus triandrus*, *Gentiana verna*, yellow Alpine Poppies, and *Phlox setacea*. Our large clump of this *Phlox* has one drawback—it is so attractive to our cats as a sleeping place that it is always sunk in the middle like an ill-made bed. We have, moreover, a great bed of *Primula japonica*, with about 100 heads of flower out; our plants of it stand closely together, which does away with the coarse effect of the foliage; the bed was fringed with a double row of the old *Primula cortusoides* (not *amœna*), which is now nearly over, but, when in perfection, it had a pretty effect. A large clump of *Camassia esculenta*, with its beautiful blue flowers, is just coming out. I might add to this list, but the above are the chief favourites now in bloom, or nearly so. Our success with Lilies in the root-work last year has led us to make more clumps of many species, and, so far, they are most promising; *L. auratum*, though young, has stems which measure 2 inches and more in circumference already. In the cool Lily house, in a pot, is a lovely bloom of *Cyclobothra cœrulea*, and many other *Cyclobothras* and *Calochortuses* are in bud.

GEORGE F. WILSON.

SPRING GARDENING AT BELVOIR.

THE spring flowers at Belvoir are arranged in sheltered openings on the well-wooded slopes on which the present castle stands, and have been very attractive during the past few months. When we saw them a week ago, the beds, borders, terraces, and scrolls were masses of soft harmoniously-blended colours, the effect of which was considerably heightened by the tender herbage and woodland beauty by which the spring gardens are surrounded and sheltered. When the flower garden is surrounded by trees and shrubs, as in this instance, charming effects of light and shade are obtained, especially late in the afternoon and evening, as the sun sinks towards the horizon, and his rays stream across masses of golden Madwort, lilac-purple Aubrietia, crimson Polyanthus, and delicate blue Forget-me-nots. There is one important feature which distinguishes the spring gardening at Belvoir from that at most other places which we have seen, and that is the artistic manner in which the colouring of the beds and terraces is softened off into the margins of rocky pathways and shrubby borders; or, in a word, the shrubby margins lose themselves in the glowing colours of the parterre, while the richness of the flower garden itself seems to melt away in the luxuriant freshness of the over-hanging trees and leafy undergrowth on all sides, leaving no trace of that harsh and unpleasing line which so often separates the trim neatness of the flower-garden from the equally enjoyable woodland walks and leafy tree-shade. One of the latest additions to the already ample beauties of Belvoir is the Duchess's garden—an irregular and extensive plot scooped out from the well-wooded slopes, sheltered on all sides by well-developed forest trees and ornamental shrubs, fringed with feathery Birch and Yews, and now jewelled with thousands of the most beautiful hardy flowers, the soft, yet rich, colouring of which no combination of Geraniums, Calceolarias, or other summer bedding plants can excel. It was a happy idea which induced Mr. Ingram to enamel the fresh green turf of this sheltered glade with spring flowers, the position being precisely similar to that which Nature herself selects for them. At the time of our visit much of the beauty of early spring flowering plants had fled; but, if we missed the delicious perfume of half-an-acre of Violets, the regal purple and gold of the vernal Crocuses, or the ruby, amethyst, or pearly colouring of the oriental Hyacinth, we obtained glimpses of the later flowers of spring, or rather of those "earth stars" which connect spring with early summer. Let us now look at spring gardening as practised so successfully at Belvoir, from a practical point of view, and note the means by which the rich and harmonious combinations of colour which are to be seen there, have been obtained. The most beautiful beds and borders at the time of our visit were those planted with well-known spring-blooming perennials, such as Lilac, Aubrietia, Golden Madwort (*Alyssum*), blue Forget-me-nots, and snowy-white Arabis; and these were here and there further enriched by the introduction of crimson-tinted golden-eyed Polyanthus, and bedding Pansies, of nearly all shades, from golden-yellow to blue, maroon and velvety bluish-black. One of the serpentine-terraced beds struck us as being exceptionally fine; it consisted of a line of the dwarf Belvoir Wallflower (which, for spring bedding, is decidedly the best), then a broad belt of blue Myosotis,

then the soft lilac-purple Aubrietia, in front of which was a broad margin of the golden-green Stonecrop (*Sedum acre*), jewelled with panel-like masses of Aubrietia, which gave a most attractive appearance to the whole arrangement. A bed of the star-like golden-flowered *Doronicum caucasicum* on a dense carpet of blue Forget-me-nots was remarkably pretty, as also were some tastefully-arranged beds of double crimson and white-flowered Daisies. The luxuriance of the great-leaved Saxifrage (*S. crassifolia*), planted in beds and borders, partially shaded by trees, was wonderful—indeed, some of the flowering stems—carrying clusters of soft rosy flowers—were nearly a yard high, and the development of the fresh green foliage was equally remarkable. Strong tufts of the *Veratrum nigrum* were scattered here and there on the fresh turf, in positions where it proves to be most attractive, its broad plaited leaves having quite a Palm-like appearance before the tall flower-stems are produced. Turn where one would, the variety of plant forms and the numerous shades of soft colouring, were most pleasing and enjoyable. The position of the Duchess's garden is one of the best that could have been selected, and the woodland scenery, as viewed from the rocky pathway above it, is most charming. To a real lover of plants the margins of these pathways and shady woodland walks afford a treat, bejewelled, as they are, with the rarer Alpine and herbaceous plants, such as Irids, Sedums, Saxifrages, Wallflowers, Bluebells, Forget-me-nots, Primulas, and curious or showy flowering bulbs. In one bed we found some very vigorous specimens of the yellow-flowered *Primula verticillata* blooming profusely, and we deem the fact worth mention here, for it is not generally known that this fine yellow Primrose and its crimson-flowered ally, *P. japonica*, are admirably adapted for naturalising on moist sheltered banks in the Alpine or wild garden. In the kitchen garden we found an enormous specimen of the old Chinese tree-Peony profusely covered with its deliciously-fragrant rosy flowers, and fully 6 feet in diameter.

B.

Beauty on Railway Embankments.—I have often seen many pretty plants on railway embankments, but never met until last week with a railway embankment converted into a bank of Primroses intermixed with Cowslips. The sight was perfectly fascinating. If I remember rightly, this charming bank was almost within sight of Stockport. Are they, I should like to ask, natural productions; or did some generous lover of Nature sow seeds or plant Primrose plants there? Either way, the flowers—and such flowers as Primroses in quantity—on the sides of the iron way, are well placed. We have hundreds of wild flowers, Grasses, succulents, Heaths, Mosses, and other plants that could be established in such places. On the shady sides, Ferns would find congenial homes. We have only to take the initiative, insert a few seeds or plants, to show Nature what is desired, and she will not fail speedily to further our endeavours. Would it not be worth while to have some kind of association to take in hand the covering of railway embankments with plants, and their conversion to utilitarian purposes?—D. T. FISH.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

German Asters Sown in the Open Ground.—Like many more I have unthinkingly followed the practice of sowing these in a frame, or in pots, and then transplanting them, but I found that the transplanting season falling, as it did, at the busy bedding-out time, was often overlooked and the seedlings neglected. I, therefore, now sow in the open border where they are to stand, and prick out as they need it. In this way I get good flowers.—N. H. P.

Mimulus in the Open Ground.—Since I wrote the other day (see p. 403) about Clapham's strain of *Mimulus*, I have put some 200 plants of them out of doors, where they promise to grow strongly and bloom profusely. The fierce winds of the past week have been bravely withstood, and every one of them is now in bloom, all being prettily and singularly varied both in markings and colours.—A. D.

Double Scarlet Geum.—This beautiful hardy perennial, though much superior to the single Geum, does not seem to be well known. It is a most continuous bloomer, flowering from spring till late in autumn. If several of the flowers are tied together in a bunch no double scarlet Geranium can surpass them in effect. With me this plant never seems to increase in size so as to admit of division, but that does not matter, as it produces seeds in abundance, and they come up freely if sown in the open garden.—G. F., Northumberland.

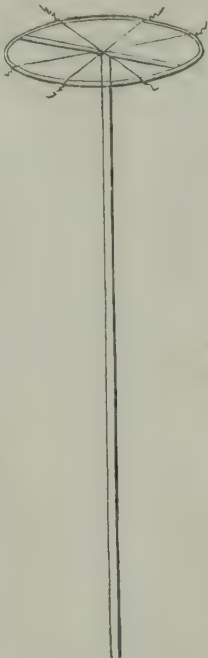
Viola pedata.—After growing this for three years, I have not been able to induce it to flower. Why it should be so reluctant to blossom I am unable to say, and should be glad to be enlightened on the subject. It is in a 10-inch pot, which contains seven strong plants raised from seed three years ago. Some others, I hear, have been equally unfortunate. Do seedling plants bloom, or is it a fact that flowers can only be obtained from plants propagated from imported stock.—ALEX. DEAN.

A Wood full of Wild Hyacinths.—I have often heard of a wood full of this flower, but never till the other day, in the neighbourhood of Sheffield, did I see one. There you could not see the ground for Hyacinths, the surface being wholly and altogether hidden by them, and this by plants which overran the wood into a meadow close by and possessed it. The area over which the plants were spread was not very wide, but it was crowded with these beautiful flowers as far as it went, and was a magnificent argument in favour of bedding out in broad masses of one colour.—D. T. FISH.

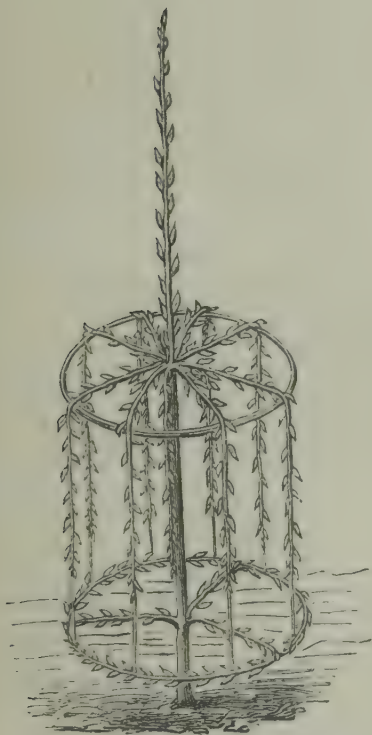
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DOLIVOT'S SYSTEM OF TRAINING.*

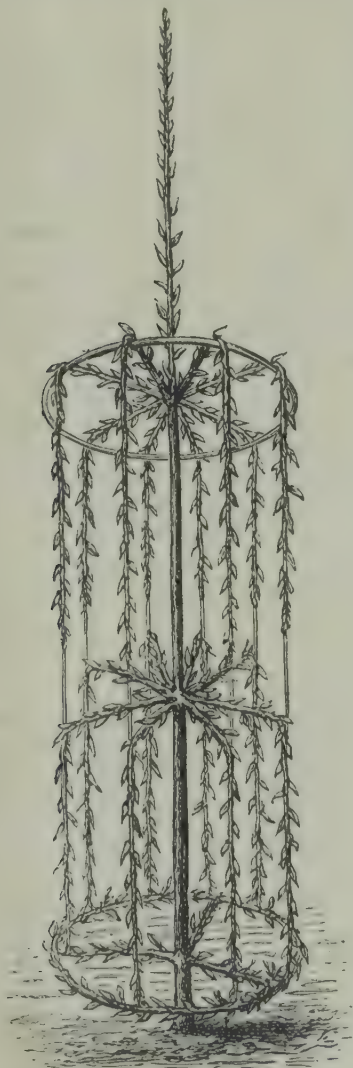
NEARLY half-a-century ago the system of training certain kinds of fruit trees so that the branches were led to assume a pendent position was practised in this country, and even now the fruit trees which margin the compartments in front of the terrace at Frogmore, as well as those along the sides of the centre walks, are trained in this manner, being carried up with clean stems to the top of a trellis, and thence again to the ground. Notwithstanding this apparent subversion of the laws of Nature these trees continue year after year in perfect health, and bear abundant crops of fine fruit. English books on fruit culture have, however, been silent, or nearly so, as regards the alleged advantage of this mode of procedure; England, indeed, is apt to show its conservatism when the utility of any old-established custom, that has answered the purposes of our forefathers, is called in question, and it is more than usually liable to do so when asked to adopt some new system, the value of which has not been stamped with the die of practical experience. It has been left, therefore, to a French writer to take the matter up. M. Dolivot, in doing so, has shown a capacity for methodically arranging and expressing his ideas that may, in a measure, be traced to his professional training as a lawyer; but we must none the less lose sight of the plain facts which both he and his assistant, M. Maître, place at our disposal. The advantages which the author alleges are to be derived from the system



Frame for young tree.

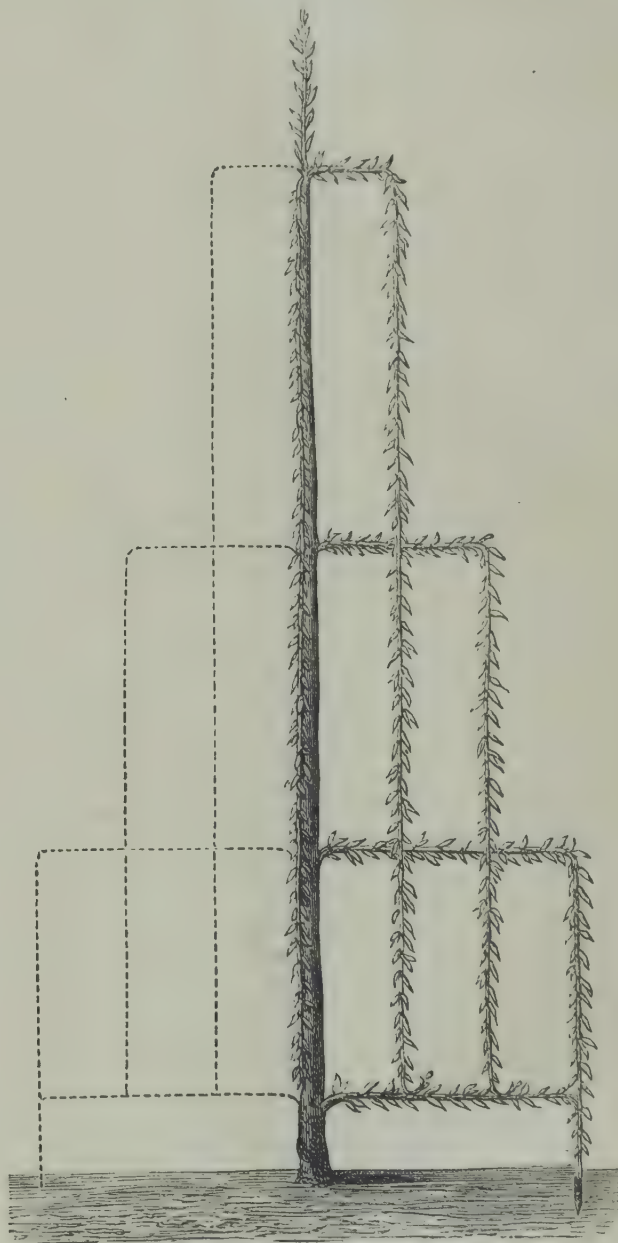


Tree after one year's growth.



Tree after two year's growth.

trees, and consequently an increase in the productive capacity of the land; thirdly, simplification in the operations of training and pruning; fourthly, resistance of atmospheric influences; fifthly, preservation of the trees against spring frosts, and great opportunities of sheltering them from bad weather; and, sixthly, perhaps the superior quality of the fruit. M. Dolivot's system, in a great measure, explains itself by the illustrations we are enabled to publish. The stem of the young tree is provided with a support, surmounted by a circular frame-work, whose circumference is kept in position by a single bar of wood, the remaining radii or spokes of the circle to the number of six being supplied by iron-wire. To these the branches of the tree are fastened horizontally, and are then allowed to fall to the ground, any refractory branches being kept down by leaden weights until they are thoroughly accustomed to their new positions, and in this they are, in some



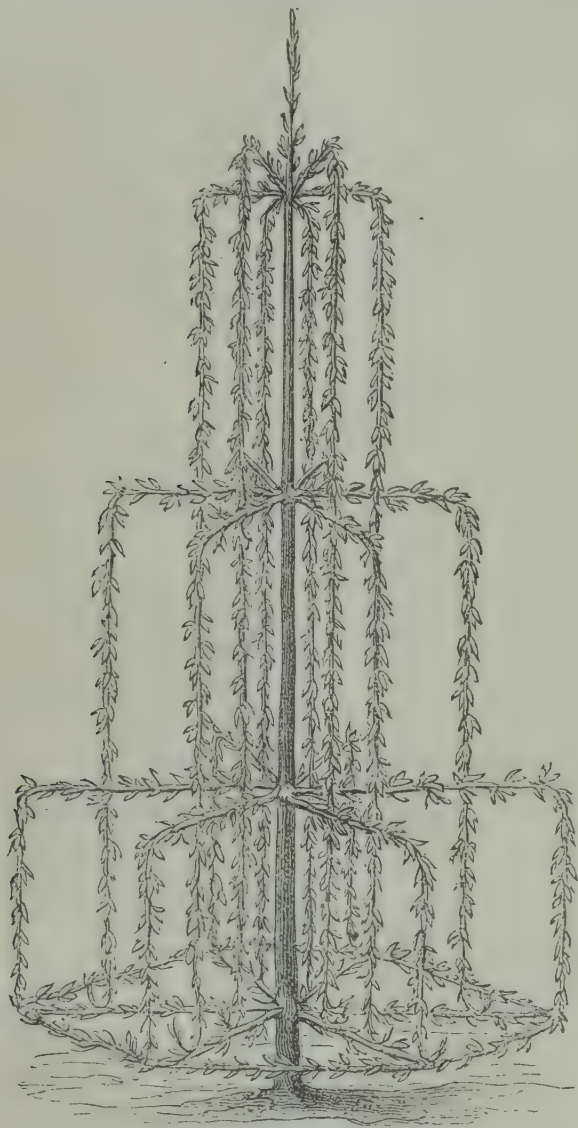
Graduated column, incomplete.

cases, assisted by means of supports fixed in the ground perpendicularly below each branch as it bends over the upper hoop. At a slight distance above the ground, a second hoop is placed, and round this, as they reach it, the trailing branches are led; the hoop being steadied in its place by four shoots which have been provided for on the lower part of the main stem opposite to it. This form M. Dolivot calls the "simple column," and the rest are merely elaborations of it, for it is easy to see that by carrying the stem up, and by the use of an additional hoop, the number of stages or tiers may be increased to three or even four, although the former number appears to be the limit attempted by the writer. One form, which is called the "graduated column," is so peculiar—we may say fantastic—that it requires special allusion to be made to it, and we therefore give illustrations of it. It has the disadvantage of occupying quite as much space as an ordinary pyramidal tree, being comprised of six wings and three tiers

which he advocates are—first, rapid fructification, especially in the case of old trees, that are apparently past bearing; secondly, economy of the space that can be devoted to fruit

* "Les Arbres Fruitiers à Branches Renversées." Par A. E. Dolivot, Grenoble.

of branches. The subject to be operated on should be a well-established young tree, the stem of which should be cut 4 feet from the ground, and seven branches secured. The uppermost branch is kept to continue the stem, and the remaining ones are trained horizontally until they reach the outer angle of the frame, when they are brought into a perpendicular position. The other stages are produced in a similar manner. No one can fail to admire the ingenuity displayed in the creation of the various forms of which the author gives examples in his book, nor the thoroughness with which he has discussed the whole matter within the limited space of 200 pages. Without going so far as the author in his very confident assertions respecting the utility of his system, this much may be said—it is based upon principles that are perfectly sound, if not universally adopted. Under certain circumstances, any method of training that tends to counteract over-luxuriance must necessarily promote fertility. Of this we have had ample proof in the processes of root-



Graduated column, completed.

pruning, ringing the branches, and summer pinching. Fanciful though the modes of training recommended in this book may be, they will doubtless have a similar effect; and, under some conditions, may be safely adopted, especially by those who have only a limited space at their disposal, but more time to attend to an elaborate system of training than is generally the case with those engaged in fruit culture on an extensive scale.

VAN HOUTTE'S "FLORE DES SERRES," VOL. XXI. PARTS I., II., and III. of this volume have reached us, and contain the following plates, many of them, we regret to see, reproduced from other works:—Plate 1 represents *Æchmea cœlestis*, a rather dull-coloured Bromeliad, producing a spike of brown and pale blue flowers. Plates 2 and 3 show a beautifully executed portrait of *Oncidium crispum*, with large brown flowers, having a deep yellow centre. It is a native of Brazil, and was figured by Loddiges in 1854, and also since by Lindley in the "Botanical Register," and by Hooker in the "Botanical Magazine." Why, therefore, does Mr. Van Houtte waste valuable space by figuring plants so frequently

illustrated in other works when newer and less-known species would be so infinitely more acceptable to horticulturists, so many of whom are subscribers to his beautiful work. In plate 4 we are shown the handsome Composite *Gaillardia amblyodon*, one of the new annuals introduced last year from Texas, we believe by Mr. Thompson, of Ipswich. Plate 5 represents *Masdevallia maculata*, a distinct and handsome species, producing flowers, the upper portion of which is golden, the lower deep purple, splitting into two curious green tails. Plate 6 shows the beautiful, and but little known, *Pittosporum crassifolium*, reproduced from the "Botanical Magazine." The flowers are deep crimson, resembling those of *Escallonia macrantha*. Plates 7 and 8 represent the handsome Palm, *Hyphæne thebaica*, as seen growing in Egypt and Abyssinia, where it is indigenous, and plates 9 and 10 two heads of the curious bearded Maize or Indian Corn, somewhat resembling in shape and appearance a bundle of the fragrant Indian Couscous Grass. In plates 11 and 12 is most faithfully depicted the beautiful Maple known under the name of *Acer polymorphum palmatifidum*, of which, unfortunately slugs and snails are so fond that they strip its branches of every leaf, when in a young state, if they once find them out. Plate 13 illustrates the curious *Mammillaria senilis*, or Old Man's Head Cactus, resembling a head of snow white hair, with prickles through it. Plate 14 is a portrait of the well-known hardy Turn-cap Lily, known as *Lilium chalcedonicum*. Plates 15 and 16 represent *Tydaea Belzebuth*, one of the many handsome seedling varieties raised in Mr. Van Houtte's establishment, and plate 17 *Pilocereus Dantwitzii*, a singular pillar-shaped Cactus, covered with white hairs, which give it a strange appearance, well thrown up by the dark green background against which it is figured in this plate. Plate 18 is a portrait of a prettily-spotted *Gloxinia*, named *Ami Thibaut*, raised by Mr. Van Houtte. Plates 19 and 20 represent several specimens of *Thrinax* as seen in their native habitat. Plate 21 accurately represents the curious and ornamental little orange-berried *Nertera depressa*, trailing over a bank, and profusely covered with its pretty fruit. Plate 22 is said to represent *Petunia intermedia*, but seems to me to much more resemble one of the *Nierembergia* family, with deeper-coloured flowers than those of *N. gracilis*. It is said to be a difficult plant to cultivate, only succeeding when grafted on *Nicotiana glauca*; it is a native of Rio de la Plata, and, though it will succeed out of doors during the summer months, it usually succumbs to the damp of our winters. Plates 23-24, though beautifully drawn, and coloured with exquisite delicacy, seem to but poorly represent, at least as far as size is concerned, the Rose, *Paul Neron*, of which they profess to show a portrait. The individual flowers of this Rose rank, as is well known, among the largest in cultivation.

W. E. G.

The Lovers' Garden.—There is a land, a delightful country, which would in vain be sought for on the waves of the sea, or across the lofty mountains. In that country, the flowers not only exhale sweet perfumes, but intoxicating thoughts of love. There every tree, every plant breathes, in a language more noble than poetry, and more sweet than music, things of which no human tongue can give an idea. The sand of the roads is gold and precious stones; the air is filled with songs, compared to which those of the nightingales and thrushes, which I now listen to, are no better than the croaking of frogs in their reedy marshes. Man in that land is good, great, noble, and generous. There all things are the reverse of those which we see every day; all the treasures of the earth, all dignities crowded together, would be but objects of ridicule, if there offered in exchange for a faded flower, or an old glove, left in an Honeysuckle arbor. But why do I talk about Honeysuckles? Why am I forced to give the names of flowers you know to the flowers of these charming regions? In this country no one believes in the existence of perfidy, inconstancy, old age, death, or forgetfulness, which is the death of the heart. Man there requires neither sleep nor food; an old wooden bench is there a thousand times more soft than eider-down elsewhere; slumbers are there more calm and delicious, constantly attended by blissful dreams. The sour Sloe of the hedges, the insipid fruit of the Bramble, there acquire a flavour so delicious that it would be absurd to compare them to the Pine-apple of other regions. Life there is more mildly happy than dreams can aspire to be in other countries. Go, then, and seek these poetic isles! Alas! in reality, it was but a poor little garden, in a mean suburb, when I was eighteen, in love, and when *she* would steal thither for an instant, at sunset! So loved I a little shut-up garden.—ALPHONSE KARR.

The Wistaria and Bees.—It has been thought that the flowers of *Wistaria sinensis* were fatal to bees; but Mr. Meehan, thinks the death of bees frequently found lying around this plant must be due to some other cause. He says that he has himself often seen hundreds of dead bees under this shrub, and formerly shared the popular idea that the flowers poisoned them; last year, however, he observed that many bees visited the flowers without apparent injury.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Planting Celery.—Early-sown Celery should now be put out; if the trenches have been prepared beforehand, as advised some time back, run the hoe over the surface to destroy any weeds that may be vegetating. Give the plants a good soaking with water before moving them, and, if they have been treated as directed, by being put out in a nursery bed 3 or 4 inches apart, they will now be in fine condition; remove them with as many roots as possible, and as much soil as will adhere to them. In moving Celery plants, there should never be occasion for the now almost obsolete practice of cutting off or shortening a considerable portion of the leaves at planting time; on the contrary, Celery, more than most crops, should never, throughout the whole course of its cultivation, from the time the plants appear above ground, until they are fit for use, receive a check more than is inseparable from transplanting them, even when that operation is performed with care. If the trenches have been prepared for double or treble rows, put the plants in a foot apart each way; if for single rows, 9 inches between each plant will be sufficient for ordinary purposes. In making the holes, use a planting trowel, and see that they are large enough to admit the roots without crushing them together; give each row a good watering as soon as planted. Celery costs more in manure and attention, to grow it well, than most vegetables, and it is worth while to treat it in a way calculated to produce it in good condition.

Leeks.—When indifferently grown, these are little better, for the purposes for which they are required, than Onions. To obtain the peculiar mild flavour which Leeks possess when large and freely grown, the plants must not be allowed to become stunted by being too close in the seed-bed; to prevent this, thin them out so as to leave them 6 inches apart.

Tomatoes.—These should now be planted against all vacant places on walls; do not make the soil in which they are to grow too rich, or it will induce the production of shoots and leaves rather than fruit; if, afterwards, the plants appear to require a stimulant, it can be given in the shape of manure-water; leave the soil hollowed out round the stems so as to hold plenty of water, especially until they have become established. Train them to the wall, either with shreds and nails, or by means of ties, so as to expose them fully to the sun. Where there is no space on walls at liberty Tomatoes may be grown in 9 or 10-inch pots; select a warm, sheltered, sunny place for them, and plunge the pots in the soil, keeping the plants through the season well thinned out and secured to sticks, so as not to be broken with the wind. It is necessary to confine the roots in pots when the plants are thus placed in the open ground, where, in an unusually wet season, too much growth for the production of fruit would be the result if the roots had unlimited scope.

Thinning Onions.—Spring-sown Onions should be thinned before they get too large. Take advantage of the soil being moist after rain to do this. If it is hard and dry, the limited quantity grown by most amateurs may be watered, so that the removal of any need not injure those that remain, which often happens, when the ground is hard. As to the distance the plants are left apart in thinning, account must be taken of the kinds grown. Large kinds, such as Rocca or Nuneham Park, require double the room necessary for small varieties, like Danvers or James's Long Keeping. If it is desired to grow well-developed bulbs of the large-growing kinds, these should be thinned so as to leave them 8 or 9 inches apart in the row; the smaller-growing, later-keeping sorts will not require more than half that room. Where some are required for pickling, a portion of the smallest-growing kinds may be left not more than an inch apart; or, unless they have come up very thickly, without thinning at all.

Gooseberries.—If the means advised in the winter of putting lime on the soil round the stems of the Gooseberry bushes as a preventive against caterpillars was carried out, little injury from these may be looked for; but, in the case of any bushes that were affected last year without this precaution being taken, their reappearance may now be expected; when any can be found they should be destroyed at once, or they will spread and quickly denude the trees of their leaves, spoiling the present crop, and doing serious mischief by weakening the bushes for another season. A dusting of dry powdered lime sprinkled over the affected trees will, if fresh and caustic, destroy many and cause the rest to fall off on the ground, where they must be killed, or they will again crawl upon the trees. This should be done when there is an appearance of some dry weather, for, if wet, the lime will be washed off before it has had any effect. The most certain method for destroying these caterpillars is by using a mixture of white hellebore (finely ground) and whitening, in proportions of one pound of the former to four or five of the latter, mixing the whole well up and applying it with an ordinary tin flour dredger, first wetting the leaves thoroughly with

the syringe; the powder thus sticks to the foliage, and the caterpillars, feeding, as they do, on the edges of the leaves, swallow that which adheres to them, and it quickly kills them; in five or six days not a grub will be found alive, when the trees can be well syringed to remove the powder from the fruit and leaves. The only objection to the use of this mixture is that the hellebore being poisonous, care must be taken that it is all washed off before the fruit is used.

Flower Garden.—Dahlias should now be planted. Amateurs who set a portion of ground apart for them should on this grow the best prepared plants, which will be those that have been struck from cuttings, these being less liable to get crowded with shoots, and consequently produce finer flowers than plants that are obtained by dividing the old roots. Where fine flowers are required, the plants should stand 6 feet apart every way. The ground can scarcely be made too rich; they should be well watered at the time of planting out, and at once secured by good stakes; but the stems should not be tied too tightly, so that their subsequent expansion may be allowed for. Round the stems, for a foot, cover the surface an inch thick with sharp sand, so as to make it less agreeable for the slugs to travel over. A little Wheat-chaff, or hard straw chopped up half-an-inch long, does much to impede their movements, for they object to travel over anything that sticks to them, and this is the case with these substances even when wet. The best of all for the above purpose, where they can be obtained, are the short clippings of bristles from brushmakers. Wet or dry, these are equally effective, and are too sharp for slugs to attempt to cross. Lime and soot dusted round the plants will stop the movements of slugs whilst dry; but, with moisture, it soon gets crusted, after which they will pass over it, and repeated applications do harm to the plants. The same material can with advantage be used round any other plants molested by slugs. Iresines, Coleus, Alternantheras, and similar tender plants, may now be planted out. Amateurs who may be making a first attempt at carpet bedding should bear in mind that the effect produced by this style of flower gardening is, in a great measure, dependent upon the different subjects employed being planted very close, so as at once to all but cover the surface, an even dense clothing to the ground being essential to give character to the arrangement. It will thus be obvious that a greater space should not be devoted to this kind of bedding than can be furnished well. The same may be said of the arrangement of larger-growing, handsome-leaved subjects, inappropriately termed sub-tropical. Although, in this "leaf-gardening," it is necessary to allow each plant sufficient room to develop perfectly, yet, they should not stand so far apart as to give them a thin straggling appearance—due allowance, of course, being made at the time of planting for the after-growth they may be expected to make in an average favourable season. Where this style of gardening is attempted, either on a large or small scale, there should always be kept in reserve a sufficient number of plants to fill up blanks caused by the failure of any of the more tender subjects employed, as a very few gaps spoil the effect of the whole arrangement. As the plants are put out see that all that require it are properly secured with sticks and ties; if the weather keeps hot and dry large-leaved specimens must be plentifully supplied with water, as any deficiency of this would tell on the foliage in a way that no subsequent attention could rectify.

Pits and Frames.—The earliest sown Melons will now be showing fruit, but none should be allowed to set until there is a sufficient number to give promise of a crop. Let the soil get much drier than usual before flowering commences; do not allow a quantity of weak, useless shoots to remain on the plants, but do not thin too much before the fruit has set. Melons are much more liable than they formerly were to go off through canker at the collar, especially when grown in pits and frames, with the shoots trained out over the surface of the soil. From the time the plants get fairly established in the soil care should be taken that, in giving water, none is allowed to touch the collar or the soil for 5 or 6 inches round the stem, and if anything in the shape of canker makes its appearance, which can easily be detected by the rough brown appearance the bark assumes near the base of the plants, all that can be done is from time to time to dust a little dry lime upon the affected part, which will sometimes arrest the progress of the disease and keep the plants alive until they have ripened their fruit.

Flower Garden and Pleasure Ground.

The present season, like many former ones, has shown that no advantage is gained by turning out tender plants into flower-beds earlier than the last week of May, unless it be in very favoured localities. In this neighbourhood the Grass was white and crisp with frost on the morning of the 17th, hail fell during the 19th, and the night was sufficiently cold to have injured such tender plants as Heliotropes, Coleuses, and others. It may now, however, be taken

for granted that Calceolarias, Zonal Pelargoniums, Verbenas, and similar plants, have been already planted out, and the putting out of the more tender varieties may now be proceeded with, such as Bouvardias, Lantanas, and Heliotropes, together with the various kinds of fine-foliaged or sub-tropical plants, and the placing out-of-doors of such plants when of considerable dimensions must be at once followed by careful staking and tying, and dwarf or trailing species should be rendered secure by being pegged down. Copious waterings must also be given should the weather continue dry, and it is of importance that this should be done as late in the evening as is practicable, or when evaporation may be supposed to be at its minimum. If it is administered in the morning or during the day, a large portion of the moisture supplied must necessarily be lost, as far as the benefit of the plants is concerned. A few plants, of each variety of which the various beds consist, should be retained in pots, for a time at least, as accidents sometimes occur, and a reserve force of this kind is often found to be useful. Some of the various kinds of variegated Pelargoniums, and other plants which are not of rapid growth, should about this time be planted in the reserve garden, with the view of affording an early supply of cuttings, thus obviating the necessity of taking them from the flower beds before they can well be spared for that purpose. Let the confusion, which is to some extent inseparable from the process of planting out, be set straight as soon as possible. Recently-formed plantations of Roses should be well attended to with water, and should also be mulched with manure. The young shoots are now, as is generally the case at this season, more or less infested with aphides, and the leaf-rolling caterpillar is also beginning to attack them. The latter must be picked off by hand or crushed by means of a gentle pressure of the fingers; and to destroy the aphides, diluted tobacco-water should be applied to the infested plants with a syringe, or they may be dusted with Pooley's Tobacco-powder during a calm evening and well syringed with rain-water on the following morning. Shrubberies are still gay with the various flowering shrubs. Lilacs and Rhododendrons have this season flowered most profusely, and, as soon as the flowers of the latter are decayed, the seed-pods should be carefully picked off and the plants should have one or two good waterings to enable them to finish their growth and to form flower-buds for another year. The young shoots of some Coniferous trees are not unlikely to be about this time attacked by a small but very destructive maggot, which, if not prevented, will inflict serious injury upon young plants of the *Pinus insignis*, the Douglas Fir, *P. Nordmanniana*, and others. Squirrels, too, are exceedingly destructive to all the *Pinus* tribe, and means should be taken to prevent injury of this kind if possible. Attend carefully to lawns, gravel walks, and drives; the weather has recently been favourable for the destruction of weeds upon gravelled surfaces of all kinds, and advantage should be taken, after heavy falls of rain, to roll them well the following day.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Roses.

Caterpillars are now found to be causing great destruction among young Rose-buds. They should therefore be looked carefully over, and all that can be seen destroyed. Afterwards the trees should have a good washing with the garden engine or syringe, mixing with the water aloes, quassia, and tobacco-water. Quassia I find best, both for destroying aphides and caterpillars. I use almost 4 lbs. of rough quassia chips in every 16 gallons of water. Of bitter aloes, 2 ounces to 6 gallons of water is sufficiently strong for Roses; tobacco-water I use as supplied by the vendors. Young growths of standard Roses will require tying up; otherwise, in stormy weather, the wind often breaks some of the best shoots. Briar Stocks, at this season, often throw up suckers, all of which should be carefully removed. They should be traced, and cut off at their source with a spade, the latter being held so as to cut from the stem, not towards it, as, in that case, the roots are apt to get injured. The late rains have beautified Roses greatly, and their vigour and beauty will be further increased by giving them a good watering with liquid manure; supplying each plant with about 2 quarts, as taken from tanks in the stable or cow-yard, watering it well in with clear water, so as to drive it down to the roots. When fine blooms for exhibition are required, large clusters must be thinned out well to one or two buds, and the plant should be mulched with cow-dung, and kept well watered and syringed, so as to maintain healthy growth, free from blight. In watering Roses for exhibition, soot-water may be used; put half-a-bushel of soot to every 10 or 12 gallons of water, and add about half-a-pint of this to every gallon of clean water. This, I find, improves the colour, both of leaves and flowers.—H. G.

Indoor Fruit Department.

Vines.—Inarching one variety of Vine on another may be successfully done now. Green wood unites to green wood much more

easily and quickly than that which is hard and brown. Young canes raised from eyes this spring should be used, and the growth should be from 3 to 6 feet or more in length, whilst the stock should consist of one of the side shoots, which has been pinched at five or six joints from the main stem. A leading shoot, which has been allowed to grow from near the bottom, will do equally well. It is an advantage to have the young Vines attached as near the base as possible, 12 inches being a very good distance. As the stock is generally much further from the ground than this, the pot containing the plant should be raised on a temporary wood stand to the required height. The process of inarching is very simple, and may be rapidly accomplished. A thin slice, about 2 inches in length, has to be taken off the two parts to be united, with a sharp knife; when this has been done the two cuts must be laid closely and neatly against each other, and then bound round with soft matting or Roffia Grass tight enough to keep them firm. In about a fortnight the union will be so far accomplished as to warrant the ligatures being loosened, and in another fortnight the matting may be removed altogether. If the union is not perfect by this time, the Roffia Grass should be left on until it is. The Vine in the pot must throughout be kept well watered, and, when the union is complete, the small cane in the pot should be cut away close to the bottom of the part connected. The part above this, if not very long, may be left on until the Vines are pruned and dressed in autumn or winter. The kind of stock is a matter of importance, as all are not equally suitable—certain varieties improve on other roots, while with others the reverse is the case. The Black Hamburgh is a suitable stock for many kinds, Muscat of Alexandria is another which seldom fails. Indeed, those which produce good fruit generally make good stocks. Muscat Hamburgh does well on the Black Hamburgh, whilst Royal Muscadine is a poor stock for most Vines; Black Prince and Burchardt's Prince are no better; Barbarossa (*Gros Guillaume*) produces more bunches on the Black Alicante than on its own roots. Inarching is not always necessary to increase the fertility of this Grape. In many places it does well on its own roots. Inarching is not always done with a view to improvement—it is often performed to hasten the fruiting of new varieties, and there can be no question about the utility of the operation for this purpose.

Pines.—The greater part of the Queens started into fruit in February will be ripe or ripening now; little or no water should be given at the root after the fruit begins to get yellow. As soon as the fruit is cut the ball must have a thorough watering to prevent the suckers from suffering. If space for successional plants be scarce, the Queen stocks may be packed closely together, after the fruit is cut, in some spare corner, to mature the suckers; successional plants which may be becoming crowded may then be thinned out to a distance which will admit of their free development.—J. MUIR.

How Flowers for the Sick Poor are Distributed.—Mr. S. Walliker, of Post-office Buildings, Hull, has lately written to the "Times" on this subject as follows:—"The work of collecting and distributing flowers for the sick and infirm poor is so rapidly spreading, and is productive of so much direct and indirect good, that you will perhaps permit me to give a few practical hints as to the commencement and the carrying-on of the work which have suggested themselves as the result of upwards of two years' experience, during which time about 30,000 bunches of flowers have been distributed among the poor of Hull. The system adopted here has been framed with the view of saving all possible trouble to those who send, as well as to those who distribute the flowers. A depôt was selected in a central situation convenient for the reception of flowers brought by rail, boat, or carrier; it is open all day, and some one is always at hand to receive the flowers and, if possible, to return the baskets and other packages by bearer, and trays about 2 or 3 inches deep, covered with galvanised iron netting, and filled with water, are kept ready to place the flowers in, so as both to refresh and preserve them. The ready sympathy of the local press was secured, and is still in active operation, and the public were requested to send flowers, made up in small posies, if possible, to the depôt. To assist the public, stout hampers, divided in the centre by an extra lid (the hampers cost half-a-crown each), with two printed leather labels, one bearing the inward, the other the outward address, are supplied to anyone who will undertake to collect and forward flowers. Small printed card circulars are at the same time sent to those who are likely to contribute to the baskets, advising them as to where they are kept and the days on which they will be despatched. A simple record of the date, the names and addresses of senders, and special remarks is kept, and the receipt of flowers is acknowledged by means of printed post-cards, only requiring the date and address to be written. The distribution here is not confined to the public institutions, but is made also to the sick, infirm, and aged poor throughout the town. To regulate the

supplies and prevent waste, printed lists giving the names of all the hospitals, workhouses, &c., and the names and addresses of all the district visitors and others who undertake to distribute to the outside poor, are prepared. These lists have seven columns. In the first, the greatest number of bunches each institution or person can dispose of is stated; the other six columns are for the days of the week. Some visitors cannot distribute flowers on certain days, and in those cases marks are printed in the respective columns opposite the visitors' names. These lists become valuable for statistical purposes and for comparison of year with year. The number of bunches, regulated by previous supplies, to be sent to each institution or person is entered on the list, and the flowers are sent out in covered baskets (to preserve their freshness and perfume) by a little lad in uniform (a half-time school-boy), who copies on a slip of paper, for his own guidance, the names and numbers. He is paid 3s. a week. When not busy he carries on his studies. During the winter months pots and pans containing Mosses and Lichens, Carrot-tops, Wheat-ears, and grains of Wheat, pots of bulbs, bunches of evergreens, &c., are sent out, so that there is never a week in which something is not done to cheer the poor, especially the sick, and to assure them of the loving sympathy which exists (too often latent, however) in the breasts of their well-to-do brethren.

SOCIETIES AND EXHIBITIONS.

ROYAL BOTANIC SOCIETY.

MAY 26.

At this exhibition, generally the best of the year, stove and greenhouse plants, Orchids, Ferns, and florists' flowers were all well represented. Pot Roses, from Messrs. Paul & Sons and Mr. Charles Turner were, as usual, excellent, and there was a good display of hardy flowers, among which may be ranked Messrs. Jackman's Clematises, of which we have already given some account.

Stove and Greenhouse Plants.—Superb examples of these came from Mr. Ward, Messrs. Jackson, of Kingston, and Mr. B. S. Williams. Mr. Ward had *Anthurium Scherzerianum*, furnished with over twenty bright scarlet spathes; the snowy white *Dracophyllum gracile*, 3 feet in diameter, and well flowered; the deep purplish-blue *Statice profusa*, fully 4 feet through; *Erica Cavendishi*, a dense globe 5 feet in diameter, and loaded with yellow flowers; *Hederoma tulipiferum*, *Azaleas*, and *Aphelexis macrantha purpurea*, all in beautiful condition. One of the most distinct and effective of all the plants staged in this collection was, however, an example of the deep orange-yellow-flowered *Azalea sinensis*, which was fully 4 feet in diameter, and a dense mass of brilliant flowers and tender young foliage. The colour of this *Azalea* is so vivid that the *Ixoras* beside it had quite a dingy brick-red appearance. Among the most distinct and effective of Mr. Williams's plants were the mauve-flowered *Bougainvillea glabra*, *Anthurium Scherzerianum* (with about thirty brilliant flower-spathes), *Medinilla magnifica*, two or three *Azaleas*, *Erica tricolor Massoni*, and *Aphelexis rupestris rosea*—all finely grown, and well flowered. Messrs. Jackson had a remarkably even and well-finished group, in which were splendid specimens of *Aphelexis macrantha purpurea*, *Boronia pinnata*, *Dracophyllum gracile*, *Pimelea Hendersonii*, *Statice profusa*, *Epacris grandiflora rubra*, *Hedera fuchsoides*, *Clerodendron Balfourii*, and the sombre greenish-yellow-flowered *Erica depressa*, all profusely bloomed, and in excellent condition, very few of them being less than 4 feet in diameter. Mr. W. Chapman, gardener to J. Spode, Esq., Rugeley, had a well-grown group, the most noticeable plant in which was a superbly-finished specimen of *Ixora Dixiana*, covered with great globular clusters of brilliant orange-red flowers. The same exhibitor had also a fine plant of the new hybrid *Ixora Williamsi*, a variety with bright orange-red flowers, in trusses fully 6 inches across; likewise a plant of the old *I. coccinea*, beautiful specimens of *Aphelexis macrantha rosea*, *Clerodendron Balfourii*, and *Erica Cavendishiana*. Foliage plants came from Mr. B. S. Williams, who had well-coloured examples of *Croton pictum* and *variegatum*, *Pandanus Veitchii*, *Gleichenia semivestita*, a superb specimen, but nearly hidden by other plants, and *Cycas revoluta*. Mr. Chapman's group included *Croton angustifolium variegatum*, *Latania borbonica*, and two or three other ornamental Palms. Mr. Carr, gardener to J. Hinds, Esq., of Weybridge, had a small but well-grown group, in which we noted *Alocasia Veitchii* (with glaucous, silvery veined foliage), *Maranta Makoyana*, and *Prichardia pacifica*. Mr. Clark, gardener to A. Shuter, Esq., 66, Belsize Park, staged half-a-dozen well-grown *Caladiums*. Mr. G. Legge, gardener to S. Ralli, Esq., had well-grown specimens of *Dracena Baptisti*, *Croton Youngii*, *C. Wisemanni* (a fine cone-shaped plant, 5 feet in height), and a good specimen of *Geonoma pumila*, a graceful stove Palm.

Ferns.—These were well represented and, as usual, much admired, their cool looking masses of green foliage serving to tone down and set off to advantage the bright colours with which they were associated. Mr. B. S. Williams had a fine specimen of the new *Alsophila australis* var. *Williamsii*, a drooping or weeping form, in which the contrast between the black trunk and deep green fronds was very effective. The same exhibitor had also a fine group, in which we noted *Adiantum Farleyense*, nearly a yard through; *Davallia Mooreana*, with fresh green fronds fully 4 feet in length; *Gleichenia Speluncæ*, and five specimens of the rare *G. Mendellii*, *Cibotium Scheidei*, and *Dicksonia antarctica*. Mr.

R. Richie, gardener to H. Prance, Esq., Hampstead, had a well-grown collection, in which were *Davallia Mooreana*, 7 or 8 feet across; a vigorous specimen of *Gleichenia microphylla*, and a fresh plant of the ever beautiful *Adiantum Farleyense*. A group of new Ferns, from Messrs. Jackson, contained one named *Phegopteris Dianæ*, a native of St. Helena, which was strikingly beautiful, its large flat fronds being finely divided, and of the freshest green tint imaginable. The same exhibitor had also a finely-cut form of the Lady Fern named *Athyrium felix-femina Jacksoniæ*. Mr. Williams showed *Gleichenia rupestris glaucescens*, *Dictyogramma japonica variegata*, *Adiantum gracilimum*, *Polystichum angulare* var. *congestum*, the curious proliferous *P. lepidocaulon*, and a small plant of *Platyserium Wallichii*. Messrs. Ivery, of Dorking, staged a small collection of hardy Ferns in a very fresh condition, many of them as delicately beautiful as the exotic species.

Azaleas.—These were, on the whole, well represented. Indeed some of the specimens were so profusely flowered that a leaf could scarcely be seen. In the amateur's class for six specimens, Mr. A. Patty, gardener to R. Thornton, Esq., of Sydenham Hill, was first with *Extranii*, *Criterion* (soft rosy-salmon), *Holfordiana*, *stella* (crimson-scarlet), and *Striata formosissima* (white, striped with rose). Mr. J. Child also staged excellent examples of *A. Barclayana* (white), *Telfordii* (semi-double crimson), *Arborea purpurea*, *Duchesse Adelaide de Nassau* (scarlet), *Iveryana* (white), and *semi-duplex maculata* (rose). Mr. G. Wheeler contributed some well-flowered plants, among which *Extranii* was a perfect mass of bright rosy flowers; and a plant of *Etirole de Flandres* attracted considerable attention, fully half its flowers being red, while those on the other half were white. In the nurserymen's class, Messrs. Ivery were first with small, but profusely bloomed, plants of *Elegantissima* (white), *Chelsonii* (bright scarlet, finely frilled), *Charles Enke* (a bright rosy-salmon, edged with white), and two or three others equally good. In the nurserymen's class for twelve plants, the same exhibitors furnished some pretty examples of skilful cultivation. Among these *Flag of Truce*, a double white variety, was well nigh perfect, both as regards growth and bloom. Messrs. Lane and Mr. Chapman showed effective groups.

Heaths.—These were well shown by Mr. Ward, Mr. Wheeler, Mr. Morse, and Messrs. Jackson, and in all cases the plants were fresh-looking and well-flowered. In the class of six plants, Mr. Ward had a large specimen of *Erica ventricosa magnifica*, studded with bright rosy flowers; *E. eximia superba*, a fine shield-shaped mass of rosy-green-tipped flowers; a good plant of the glaucous-leaved *E. elegans*; as also of *E. tricolor impressa*, a kind with large salmon-tinted white flowers. Mr. G. Wheeler had *E. ventricosa coccinea minor* (rose), *E. Cavendishii*, and the old white *E. candidissima*. Mr. Morse contributed a good plant of the bluish-tinted *E. mirabilis*, one of the prettiest of all Heaths; a good specimen of *E. insignis*, and the bright rosy-crimson *E. Westphalingii*. Messrs. Jackson, who were first for six Heaths in the nurserymen's class, had a perfect specimen of *E. ventricosa coccinea minor*, fully a yard in diameter, and profusely bloomed. Messrs. Jackson were also first for twelve Heaths, of which Mr. Ward had a dozen well-bloomed specimens, and was first in the amateurs' class.

Orchids.—Of these half a dozen good specimens came from Mr. B. S. Williams, the kinds being *Cattleya Mossiæ*, with seventeen flowers; *Cypripedium barbatum*, with forty flowers; *C. villosum*, with twenty flowers; *Lælia purpurata*, with seven good spikes, bearing five or six flowers each; *Vanda tricolor*, with three spikes; and a fresh and healthy plant of *Aërides odoratum majus*, with seven spikes; Messrs. Jackson also had a good and well-bloomed collection, in which were a superb variety of *Cattleya Mossiæ*, bearing some twenty flowers; *Odonoglossum citrosum*, with four good spikes; a well-grown *Vanda insignis*, with nine spikes; *Dendrobium macrophyllum* (macranthum) giganteum; and *Cypripedium villosum*, and *Saccolabium præmorsum*. Mr. J. Child, gardener to Mrs. Torr, Garbrand Hall, Ewell, staged examples of *Dendrobium Farmerii*, with five spikes; *Aërides Fieldingii*, with three branched spikes; *Cypripedium Stonei*, with two four-flowered spikes; *Oncidium ampliatus majus*, with seven branched spikes, the longest fully a yard high; *Lælia purpurata*, and *Vanda suavis*. Mr. J. Ward showed superb examples of *Odonoglossum Phalæopsis*, nearly 2 feet in diameter, and bearing about 10 fully expanded flowers. The most remarkable plant in this group, however, was a specimen of the new *O. vexillarium*, bearing eighteen great deep rosy flowers on three spikes. The foliage of this plant was tinged with purplish-brown, and one spike alone bore seven fine flowers. Mr. Morse, Epsom, Mr. Richie, and Mr. G. Wheeler, also furnished collections. Messrs. Veitch & Sons contributed some rare Orchids, the most remarkable among which were *Vanda Parishii*, with two strong spikes; *Cattleya Mendellii*, with a three-flowered spike—the contrast between the snow-white perianth segments and the rich carmine lips being very beautiful; *C. gigas*, with a three-flowered spike of mauve flowers, the rich crimson-purple lips having two whitish eye-like spots, which give additional brightness to the rich colouring. From the same firm also came *Pescatorea Dayana*, a species in the way of the better-known *P. cerina*, but with segments tipped with dark crimson, *Cattleya tricolor*, *Cypripedium selligerum*, *Lælia elegans alba*, and others, making altogether an effective group.

Hardy Herbaceous Plants.—Of these Mr. R. Parker contributed a well-arranged collection, in which were *Orchis foliosa*, bearing a dozen spikes of purple flowers, and rose and crimson-coloured varieties of *Pæonia officinalis*; *Hyacinthus amethystinus*, with some twenty or thirty slender spikes of porcelain-blue flowers; and a white-flowered and effective *Pyrethrum* named *Boule de Neige*. The same exhibitor had also a fine potful of the rich purple *Iris spectabilis*, bearing a dozen deep velvety flowers; a dense mass of *Scilla cernua rubra*, bearing numerous

spikes of rosy-lilac blossoms; *Spiræa japonica* and *S. palmata*, both excellent in their way; a snowy mass of *Iberis corifolia*, and a plant of the Irish Butterwort (*Pinguicula grandiflora*). Mr. G. Wheeler, who was second, had an interesting group of Wallflowers, Primulas, Irises, Saxifrages, Lupins, and *Iberis*.

Roses in Pots.—These were well represented by excellent groups furnished by Messrs. Paul & Son and Mr. Charles Turner, who were the only competitors. Messrs. Paul had well-flowered plants of Madame St. Joseph, a delicate salmon-tinted Tea variety; Marie Rady, crimson; Celine Forestier, sulphur-coloured Tea; Vicomte Vizier, deep velvety-crimson; Souvenir d'un Ami, soft rosy Tea; Madame Alice Durian, bright rosy-lilac; Victor Verdier, deep rose; and Camille Bernardin. Mr. Turner showed Madame T. Levet, silvery-rose; Paul Verdier, crimson; La France, rosy-blush; Souvenir d'un Ami, blush; Madame Victor Verdier, crimson; Anna Alexieff, soft rose; and Charles Lawson, bright rose. In the class of six Roses in pots, the position of the competitors was reversed, Mr. Turner being first and Messrs. Paul & Sons second, both contributing well-grown profusely-bloomed plants. In the class of twenty Roses in pots, Messrs. Paul & Sons were first with small, but profusely-flowered, specimens; and Mr. Turner was second.

Florists' Flowers.—What are called show Pelargoniums were well represented, Mr. James, gardener to W. F. Watson, Esq., of Isleworth, having well-grown shield-shaped plants, and the same exhibitor was also first in the open class for nine specimens. In the class for nine show Pelargoniums, in pots not larger than 8 inches across, Mr. J. Ward was first, and had splendid examples fully 4 feet in diameter, and profusely bloomed. The varieties were Warrior, scarlet and black; Royal Albert, salmon and black, white eye; Mary Hoyle, pale rose, maroon blotch; Maid of Honour, white and lilac, dark blotch; Desdemona, white, reddish-brown blotch; and Rob Roy, bright rosy-lilac, dark blotch. Mr. Bull sent a new semi-double Pelargonium, with purple flowers, named *P. cucullatum* fl. pl. Mr. Bull also exhibited a new Pelargonium, named Beauty of Oxtou, with rich maroon white-edged flowers. Mr. G. Brand staged six plants of his new white Pelargonium Duchess of Edinburgh, one of the best of all new kinds, invaluable as a decorative plant. Mr. J. George sent a group of new Ivy-leaved Pelargoniums, some of which have very fine flowers, rose, white, lilac, and scarlet being the principal colours. For basket-work or boxes these varieties will be found useful. C. B. Forster, Esq., sent three groups of new fancy Pelargoniums, several of which were certificated. Three new Azaleas came from Messrs. Ivery, among which were Sunrise, a dense-habited plant, bearing a profusion of white-edged salmon-striped flowers; Emma Ivery, deep rich rosy-crimson; and Butterfly, pale rose, margined with white, red blotch. Messrs. Jackman staged two splendid new Clematis—one, *C. alba magna*, has flowers measuring quite 8 inches in diameter, the segments being nearly 3 inches across, and as delicately fashioned as a Phalænopsis; the other, *C. Mrs. Hope*, bears flowers of a delicate bluish-lilac tint, 6 inches in diameter. Both are lovely additions to this beautiful group of decorative plants. Herbaceous Calceolarias were staged in admirable condition by Mr. James and Messrs. Dobson, both of whom had effective groups, in which the colours were very rich and bright. Mr. C. Turner sent a new seedling forcing Pink, named Derby Day, a large flower of a rosy tint, with dark marking.

Botanical Certificates were awarded to the following new and rare plants:—

Agave Besseriensis major (Croucher).—A robust form of this very variable species, with glaucous rigid leaves, each terminated by a formidable dark brown spine.

A. Veitchii (Croucher).—A dense growing plant, with deep green leaves, each about a foot in length.

A. Beaucarnea (Croucher).

A. marmorata (Croucher).—A robust growing plant, with recurved glaucous foliage of great substance.

A. polyantha (Croucher).—A long-leaved glaucous species of ornamental habit.

A. Pilgrimi (Croucher).—A dwarf deep green-leaved species of the *A. horrida* type, and a welcome addition to this dwarf-growing section.

A. pubescens (Croucher).

A. (Fourcroya) variegata (Croucher).—This plant has long slender foliage, and somewhat resembles a weak form of *A. americana* in habit and colour.

Dasylium longifolium glaucum (Croucher).—A graceful-habited plant of tufted habit, having long glaucous foliage. It is a welcome addition to a well-known group of decorative plants.

Athyrium f. f. Jacksoniæ (Jackson & Sons).—This is a very beautiful variety, with fronds about 2 feet in length, very delicately cut, and of the freshest green colour imaginable.

Phegopteris Dianæ (Jackson & Sons).—This is a strong-habited and very ornate Fern from St. Helena, having tripinnate fronds of leathery consistence and a delicate light green colour.

Dioscorea retusa (Veitch).—A climbing plant, with deep glossy green five-lobed leaves. It bears Hazel-like catkins of a Pea green colour, and is a very distinct and effective decorative plant.

Vanda Parishii (Veitch).—A rare and distinct Orchid, bearing seven-flowered erect spikes of waxy flowers. The sepals and petals are of a light green tint, blotched with brown, the trowel-shaped lips being of a bright carmine colour. The plant is dwarf in habit, the leaves somewhat resembling those of *Phalænopsis grandiflora*.

Cattleya tricolor (Veitch).—A slender-growing Orchid, bearing creamy-white flowers, the pure white convolute lips being blotched with lemon-yellow, and streaked with bright red. It is a very distinct and effective species.

Cypripedium selligerum (Veitch).—A new hybrid Lady's-slipper, the result of a cross between *C. barbatum* and *C. lævigatum*. The leathery leaves are of a glossy green, with dark markings, and the flowers are borne on a tall two or three-flowered purplish scape. In colour they most resemble those of *C. barbatum*, but the petals have a tendency to elongate. It is a very effective and free-blooming plant, of vigorous habit.

Nepenthes alba marginata (Veitch).—A very pretty little Pitcher Plant.

Abutilon Darwinii (Veitch).—A dwarf and free-blooming Malvad, with heart-shaped leaves and axillary orange-scarlet flowers.

Agave Salmiana fol. aureis variegatis (Veitch).—A strong-growing American Aloe, with stout leaves striped with creamy-yellow or white.

Adiantum Hendersoni (Veitch).—A strong-growing and very ornate Maiden-hair Fern, with gracefully-arched fronds 2 feet in length. The young fronds are of a bright purplish-brown tint, and the plant well deserves culture.

Platyterium alciorne Wallichii (Veitch).—A stout-growing Stag's-horn Fern of distinct habit.

Odontoglossum vexillarium album (Veitch).—A very pale form of one of the most beautiful Orchids in cultivation.

Acalypha marginata (Williams).—A very effective stove foliage plant, of easy culture.

Agave marginata (Williams).

Alsophila australis Williamsii (Williams).—A Tree Fern of graceful habit, the fresh deep green fronds drooping around the dark brown stem.

Geonoma gracilis (Williams).—A stove Palm, of easy culture and elegant habit.

Platyterium Wallichii (Williams).—A very ornamental Fern, belonging to the Stag's-horn group.

Dictyogramma japonica variegata (Williams).—A strong growing Fern, with leathery pinnate fronds, of a fresh green colour, and well worth culture as a distinct and effective variety.

Polystichum lepidocaulon (Williams).—A distinct stout-growing plant, with simple pinnate fronds, the rachis of each being prolonged into a proliferous caudal appendage.

Sonerila Hendersoni (E. G. Henderson).—A very beautiful stove, foliage, and flowering plant, with ovate deep green leaves, marbled with silvery-grey. The flowers are of a delicate rosy-lilac colour, and very freely produced.

Dendrobium Wardianum var. (Low & Co.).—A very thick bulbed short-jointed variety of a well-known Orchid, bearing large and richly-coloured flowers.

Blandfordia princeps (Bull).—A free-growing grassy-leaved plant, bearing erect spikes of rich orange-yellow drooping flowers, shaded with red at the base. Well worth culture as a greenhouse decorative plant.

Athyrium f. f. apicale (Bull).—A very beautiful form of the common Lady Fern.

Osmunda obtusiloba (Bull).—A strong-growing North American half-hardy sub-aquatic Fern, having elegantly lobed fronds of a light green colour.

Sadleria cyathoides (Bull).

Cibotium glaucum (Bull).

Nephrodium truncatum (Bull).—A free-growing decorative Fern, well suited for greenhouse culture, having a plume-like habit of growth.

Floral Certificates were awarded to the following:

Clematis alba-magna (Jackman).—A very attractive decorative variety, bearing great star-like satiny-white flowers 8 inches in diameter, the segments being nearly 3 inches across in the widest part.

Clematis Mrs. Hope (Jackman).—A bluish-lilac variety with full broad-sepal flowers about 6 inches in diameter.

Clematis J. P. Gassiot (Jackman).

Pelargonium Sappho (C. B. Foster).—A large round flower of a rosy-vermillion colour tinged with lilac and having a blackish blotch.

P. Eclipse (C. B. Foster).—A rosy-salmon suffused with scarlet, with a black blotch.

P. Flirt (C. B. Foster).—A large rosy-lilac flower of good form, the upper petals nearly all black with red margins.

P. Edith (C. B. Foster).—A soft rosy-salmon-tinted variety with dark blotch and distinct white eye.

P. Revenge (C. B. Foster).—A brilliant fiery scarlet, with a dark-feathered blotch, very bright and distinct in colour.

P. Beauty of Oxtou (Bull).—A free-blooming decorative variety of dwarf habit, the flowers being of a deep maroon tint blended with scarlet and margined with white. It is a fine companion to Queen Victoria, which, in habit and shape of flower, it resembles.

Fancy Pelargonium Miss Porter (C. Turner).—A very bright light-coloured flower, delicately tinted with rosy-lilac.

Pelargonium Countess of Dudley (C. Turner).—A free-blooming variety of dwarf habit.

Forcing Pink Derby Day (C. Turner).—A dwarf-habited free-blooming Pink, bearing large full fine coloured flowers, with dark velvety markings.

Spirits of Camphor as an Insecticide.—Allow me to inform "E. W. H." (see p. 436) that I never heard of camphor being used as a fertiliser; but, for some years past, I have found spirits of camphor and soft soap to be an excellent insecticide.—T. B.

Keeping Mice off Peas.—I have never tried soaking Peas in bitter aloes or Gentian to save them from mice as mentioned by your correspondent (see p. 416); but I find that slightly coating them with red lead before sowing answers the same purpose. Will your correspondent tell us what the strength of his steep is?—R. McK.

William the First Pea.—I have this day (May 26) picked my first dish of William the First Peas; they may be somewhat later than Ringleader, but very little; Ringleader we picked the day before, all being sown on the 9th of November. It never had any protection, except coal ash when first coming up.—R. GILBERT, *Burghley*.

—This bids fair to shortly supersede all the old early round kinds; it yields Peas fit for use quite as early as Dillestones, and it has, in addition, large handsome well-filled pods. Growers for market will find it worth their attention.—A. D.

Black Fly on Cherry Trees.—I never remember seeing the Cherry trees, particularly Morellos, so infested with the black fly as they are this season. They are easily killed with gas water diluted with one-third of pure water. Take a common garden saucer, and dip the ends of those affected, gently rubbing the shoot when in the solution.—R. GILBERT.

Northampton Hero Broccoli.—I notice that Mr. Tillery recommends various kinds of Broccoli in THE GARDEN. I was asked by Mr. Watts last season to try Northampton Hero. On the 15th of May I cut two of snowy whiteness, beautifully compact, not over large, but of the best quality.—R. GILBERT.

Morris's Measuring Instrument.—In external appearance this resembles a watch and it is much the same in size, the dial face representing the feet and inches instead of hours and minutes. Like the chartometer by the same maker, figured by us some time back (see p. 528, Vol. VI.), it has a small steel wheel projecting from the side which, when made to traverse the surface to be measured, turns round the hands, the larger of which indicates the inches and fractions of an inch, the smaller hand the feet, and the third hand the tens of feet. It is an ingenious little instrument, which for many purposes will, doubtless, prove useful.

"This is an art

Which does mend nature: change it rather: but

THE ART ITSELF IS NATURE."—*Shakespeare.*

ROCK-GARDEN AT EASTER DUDDINGSTON LODGE.



OR the benefit of those amongst your readers who are lovers of Alpine plants I gave at p. 453, Vol. IV., of *THE GARDEN* a brief account of the rock-plant department at Easter Duddingston Lodge, the residence of Mr. Charles Jenner. Since that time considerable additions have been made to it. In my previous notice of this collection, I particularly alluded to the dwarf shrubby Ericaceous Alpine plants. I will now endeavour to furnish a few remarks on the herbaceous Alpines for which this garden has been long famous. About 1,200 of these interesting plants are cultivated at Easter Duddingston in pots, in a pit 94 feet long, 4 feet wide, and 2 feet 6 inches in height. The pots are all plunged in sand.

It would be needless here to give a complete list of their contents. Suffice it to say that the collection contains many novelties both in, and showing flower. At present, *Primula Parryi* is particularly noticeable, its beautiful rich blooms, of a dark purplish colour, being very attractive. *Lewisia rediviva* is growing here vigorously, and is covered with buds. How to get this botanical gem to flower seems to puzzle many. The plant in question, like all the other Alpines in pots, is plunged in sand up to the rim of the pot, and a bell-glass is kept constantly suspended a few inches above it. This prevents rain or artificial moisture from touching its crown, and the sand bath, which is occasionally moistened, is sufficient to keep the soil somewhat damp, an arrangement better suited for its growth than surface-watering. The *Lewisia* is perfectly hardy, and, if treated in this way, flowers annually. It is grown in a mixture of loam and peat, having a few pieces of sandstone placed over the surface of the pot. *Ranunculus parnassifolius*, a plant now rarely seen in cultivation, also flowers profusely here; and *Meconopsis aculeata*, a charming blue Poppy from the Himalayas, has a spike of flower buds about 1 foot high, the uppermost buds opening first; and, as several spikes are generally produced on the same plant, a long-flowering period is obtained. The yellow *Meconopsis Wallichiana*, from the same mountains, may also be seen in this collection; and besides these, numerous other interesting Alpines are here cultivated in pots, such as *Ramonda pyrenaica*, *Dianthus alpinus*, *D. Tymphrestus*, and *D. glacialis*, *Trifolium uniflorum*, and all the rarer species of *Primula*, *Soldanella*, *Gentiana*, *Androsace*, *Astragalus*, and *Oxytropis*. A pit, 58 feet long, 4 feet wide, and 2 feet high in front, is devoted to the culture of bulbous and tuberous-rooted plants. The surface, after being well drained, has been arranged into two hundred stone compartments, varying from 6 to 12 inches in diameter; and in these the roots are planted out in soil suitable for them. During early spring, these bulbous plants produce a pleasing display, owing to the number of plants then in bloom; but, at present, few are in flower. Among such as are in blossom, *Narcissus triandrus*, *Scilla amoena*, *Leucocoryne alliacea* and *uniflora*, several species of dwarf *Alliums*, *Fritillaria kamschatkica*, with its curious black flowers, and *Corydalis nobilis*, a truly magnificent species, are the most conspicuous. The Alpine plants, forming the chief open air collection, are cultivated in triangular stone compartments, arranged round a series of raised geometrical clumps, making altogether 1,400 divisions of various sizes, as

previously described in *THE GARDEN*. Many of the specimens are large and wide-spreading, and now present a magnificent appearance, both in and out of bloom. The following measurements of the circumference of a few of the leading species will give an idea of the way in which Alpines thrive when turned out of pots. *Salix reticulata*, 7 feet round; *Iris cristata*, 3 feet 9 inches; *Lithospermum fruticosum*, 3 feet 9 inches; *Epilobium obtusifolium*, 3 feet; *Arctostaphylos alpina*, 2 feet 6 inches; *Phlox setacea*, 5 feet; *Phlox setacea violacea*, 5 feet; *Cornus canadensis*, 4 feet 6 inches; *Teucrium pyrenaicum*, 3 feet 9 inches; *Aubrietia Campbells*, 4 feet 6 inches; *Rubus arcticus*, 2 feet; *Trifolium uniflorum*, 2 feet 3 inches; *Arenaria purpurea*, 2 feet 6 inches; *Rosa pyrenaica*, 5 feet; *Veronica Guthriana*, 4 feet 6 inches; besides these, the early *Saxifrages*, *Pentstemons*, *Lithospermum Gastoni*, *Ramonda pyrenaica*, *Iberidella rotundifolia*, *Dracocephalum grandiflorum*, *Hutchinsia alpina*, *Dianthus alpinus*, and *Gentiana verna* are all large and worthy of notice. The surface soil of all the angular stone compartments slopes slightly towards the back, an arrangement which enables the rain or water given artificially to soak immediately to the roots, instead of running off, which it is apt to do when the ground slopes towards the front. In making rocky gardens, this is a matter worthy of attention, inasmuch as the water soaking, as it does, into the stones behind, enables the roots to exist in dry seasons on the moisture imbibed by them for a much longer period than could possibly be the case under any other arrangement. On one portion of the ground, in connection with the geometrical rock-garden, a large corrie or gully has been formed, running east and west, and the internal, as well as external, irregular undulating slopes of this are, for the most part, formed into pockets for the accommodation of plants; and broad, shelving stone projections, the under-sides of which afford shelter to plants that require more shade than can be obtained in the ordinary outside compartments, where the sun has full access to them. These arrangements have been skilfully carried out under the direction of Mr. Charles Howie, of Largo, a gentleman, whose love for British Alpines, and knowledge of the localities in which they naturally grow, has enabled him to do ample justice to Mr. Jenner's collection. Besides the rock departments, a considerable extent of ground is devoted to hardy herbaceous plants. Of these, several hundred species are systematically arranged in borders. Like the Alpines, the plants are all numbered, and entered in a garden book. The Ericaceous section at Easter Duddingston is also very extensive; the plants, however, instead of being cultivated in stone pockets or compartments, are spread over the surface of the raised beds, which are surrounded, as has already been stated, with the angular stone boxes for the growth of the herbaceous Alpines. Hardy and half-hardy Ferns are also especial favourites at Easter Duddingston, the stronger kinds being grown on rock compartments having a northern aspect. A house, 21 feet long, 6 feet wide, and about 8 feet in height, is arranged into two divisions—the back and sides being fitted up with rock-work—and is almost wholly devoted to the culture of *Scolopendriums*, of which there is here a good collection, all in the most perfect health. The roof, which slopes to the north, represents a series of steps, the upright portions only being of glass; with the exception of 3 feet of brick wall at the bottom, all the rest is open, and water from a small perforated pipe keeps the whole moist. The rarer British Ferns are all well represented, one glazed pit, 6 feet long and 3 feet 6 inches wide, having a northern aspect, is entirely devoted to the *Cystopteris montana*, which are in excellent condition. The roots run vigorously over the peat soil in which they are planted, and many of their fronds measure from 8 to 12 inches in length. Advertised novelties in the way of Alpines are generally small when first offered for sale, and often so weak that great care is necessary to keep them alive; so, instead of giving a small price, say 2s. 6d., for a plant, it is better to give 7s. 6d. for one three times the size. In this way good flowering specimens may be got up at once, instead of having to wait a year or two nursing them into vigorous growth. Were this system more generally practised, the disappointments now experienced would not be so great, even though fewer specimens were bought. J. M'NAB.

NOTES OF THE WEEK.

— THE Madresfield Court Grape is now, and has been for the past fortnight, in good condition, in Covent Garden Market. It has the finest flavour of all the Grapes ripe at this early season. The specimens in the market have been grown by Mr. Wilmot, of Isleworth.

— A SUM of £500 has been included in the estimates as a salary for an assistant-director of Kew Gardens. Professor Dyer has been appointed to the office. He has for some time past acted as secretary to Dr. Hooker.

— M. RIVIÈRE reports that the plantations of Eucalyptus in Algeria have had an excellent effect from a sanitary point of view, certain spots noted for their unhealthiness having become comparatively free from disease.

— IN the Chiswick Gardens fruit trees are bearing abundant crops. The orchard-house trees, too, are laden with fruit, as are also those in the long Peach-house, or glass wall, as it is sometimes called. Trials are being made of Pansies, bedding Geraniums, Onions, and other flowers and vegetables.

— AT least one "distinguished" alpine flower now adorns the flower-shops and stands in Covent Garden. The beautiful pyramidal Saxifrage, which in early summer rears its little tree of flowers so frequently on the sunny side of the Alps, is now in perfection in small pots in Covent Garden. It is used for table and room decoration.

— Two striking panfuls of *Utricularia montana* were shown the other day at Croydon; their flowers were borne on long flexuose spikes, and were of a snow-white colour with a blotch of lemon-yellow on the broadly-expanded lip. In colour and size they reminded one of *Phalæopsis grandiflora*. They were grown by Mr. Hill, gardener to Sir William Marriott, of Down House, Blandford.

— WE have to hand Mr. Riley's excellent and exhaustive "Seventh Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri." Although local, being written for one American state, it is of interest to the world at large, from the vast mass of important information which it contains in reference to the Phylloxera, the Locust, and many other insects, and from its excellent illustrations.

— THE annual meeting of the United Order of Free Gardeners took place at Newcastle the other day. The President said that since the last meeting about 2,000 had been added to the roll of membership, which now numbered upwards of 140,000; that the contributions had been £41,303; and that the amount expended for sickness and funerals £36,389.

— THE remarkably fine Tomatoes shown by Mr. Miles, of Wycombe Abbey Gardens, at South Kensington, the other day, shows that, wherever there are hothouses, it is an easy task to have these in perfection a good many weeks earlier than they appear in our markets. The Tomato is every day becoming more popular; and the many who enjoy it will be grateful to cultivators who thus lengthen the season when it may be had in perfection.

— THE "Florist and Pomologist," for June, contains coloured plates of the new *Echeveria Peacockii* (one of the most distinct and effective of the whole genus, a native of New Mexico, and synonymous with *E. Desmetiana*) and the Condor Peach (one of the latest and best of Mr. Rivers's seedlings). The latter bears fruit of medium size, with a distinct suture and nipple-like point, the downy skin being yellow washed and speckled with rosy-red. The flesh is whitish, blotched with red near the stone, juicy, piquant, and rich.

— THE first dinner of the new Horticultural Club took place on Wednesday evening, when a considerable number of gentlemen interested in horticulture met together at the club rooms, 3, Adelphi Terrace. The avowed object of the founders of this club is to promote a social organisation for horticulturists which may be free from any kind of cliquism. So far, this aim seems to be in a fair way of being realised. The secretary is the Rev. W. H. Dombrain, Westwell Vicarage, Ashford, Kent.

— WE had frost here (writes a correspondent, who resides 6 miles east of Nottingham) on Sunday night last, but, luckily, we lie high, and the air was dry. I hear that, in the Valley of the Trent, Potatoes have suffered to some little extent. To day (June the 1st) the sun has been burning hot, with a cold east wind blowing. Looking over Pears the other day, I found that the promising appearance which they had when in bloom will not be maintained as regards fruit. Some kinds (Winter Nelis, for instance), which were literally white with bloom, have scarcely set a fruit.

THE FRUIT GARDEN.

WALL FRUIT CROPS AND SPUR PRUNING.

ALMOST every kind of fruit has set so abundantly that thinning must be effected on an extensive scale, or both trees and crops will suffer. I find that Apricots are set equally as well on unprotected trees as upon those that have had coverings provided for them. I refer here to the temporary protection afforded by blinds and rollers, nets, &c., which are usually provided for the choicest wall fruits through the critical season of flowering; but I place most reliance on the wall itself, or rather the latent heat which is stored up in it during the day, and which protects the blossoms from injury during the night. For this reason I train all our wall trees as closely as possible to the wall; in fact, when nailed after the winter pruning, I like all the young wood to lie on the wall itself. It appears to me quite useless to build expensive walls and train the choicest trees upon them, and then allow their bearing-wood to extend so far from the masonry that they are in little better position than standards or espaliers. All spurs that project more than 2 inches from the wall I cut clean off, and train in a succession of young wood all over the tree, and I do not find any more difficulty in furnishing Apricots, Plums, and Pears, than I do in the case of Peaches and Morello Cherries. The fruit is both finer and more numerous on young wood than on old hard spurs, which, if allowed to grow on the extension system, soon get so bare at the base that it is impossible to prune them back without making unsightly gaps in the tree. When trees have been spur-pruned for several years, this is the best season for commencing to gradually renovate them by taking off the longest spurs and training in young growths to fill the vacancies. I never saw any harm occur through pruning when the trees are in full leaf. Pear trees are greatly benefited by this treatment; for, if spur-pruned year after year, they only produce breast-wood on two-thirds of the tree, and fruit at the extreme ends; and, although they do not usually fruit on the one-year-old wood, yet, the second and third seasons are nearly sure to give a crop of fruit on all young growths. There are some few kinds of each sort of fruit that appear as if they would bear crops under any circumstances, either pruned or unpruned, but I do not know a single variety that does not produce the finest fruit on the young wood. With fan-trained trees for stone fruits, and horizontally-trained ones for Pears; a good supply of young bearing wood evenly distributed over the tree; the roots mulched so that they never suffer from drought; all aphides destroyed on their first appearance; and a light and portable protection during the critical season, if a crop of fruit is not ensured, you may be certain that your neighbours, with heavy copings and permanent coverings, will not have a better one. After trying rollers, coping-boards, tiffany, and other contrivances, I must confess that our best protectors are old herring-nets, supported at least 1 foot clear of the trees; and, in case of severe frost, supplemented by light evergreen branches. All kinds of coping either blanch the young growth, or do more harm to the trees than is repaid by the crop.

J. GROOM.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Apple Blossom Maggot.—This is very troublesome here this season. It not only eats the fruit, but it punctures the leaves. For the last fortnight, during dull days, we have been well washing the trees with soap and water, applied by means of a powerful garden engine, and with apparently good results.—R. GILBERT, *Burghley*.

Grafted Vines.—I have had the Muscat Hamburgh grafted upon the Black Hamburgh, as I was recommended to do in order to give it increased vigour. Instead, however, of this being the result, it remained a weakly Vine, showing small bunches of indifferent Grapes, until I tried it again on its own roots, when it produced large and well-coloured bunches, although growing in a light sandy soil.—J. MILLER, *Clumber*.

Strawberries in Pots.—Referring to recent notes on the advantages of using pans and sods in Strawberry forcing, Mr. Gilbert, of Burghley, writes that "both sods and saucers are useless. I grow here 2,500 plants in pots. We have no Strawberry-house, but grow them in Vineries, Melon-houses, and Pine-stoves. Immediately they are coloured, we put them into cold houses to flavour, and just now we have about 200 flavouring in the early pot Vinery. We gather a daily supply of excellent fruit. If sods were used, shifting them would not be practicable, and as to emptying the saucers in dull weather, it would take up more time than can be spared."

Pruning Old Vines.—In some of the Vineries here the Vines were for years pruned upon the spur system—a practice which had the effect of rendering them very unsightly. In order to remedy this, and bring the spurs, so to speak, home again, I have used the knife freely amongst those that were stag-horn-shaped for several seasons. This is the third year in which they have been close-pruned, and it is astonishing to observe the growth they are at present making. They are showing an immense number of bunches, and, strange to say, even where I have pruned them into the old wood, dormant eyes have pushed out, and are bearing clusters of Grapes, with large healthy foliage, free from speck or spider, which, from the vigorous habit of the Vines, are heavily bespangled every morning with dewdrops, which dry off as air is given, but which I know to be a true sign of health.—J. MILLER, *Clumber*.

THE FLOWER GARDEN.

THE ANNUAL LARKSPURS.

Delphinium Ajacis or Ajax Larkspur.—This grows wild in the south of France, and extends along the Atlantic coast of that country as far as Nantes. It is also found in Portugal, Algeria, Italy, Turkey, southern Prussia, the Taurus, and its distribution extends even as far as the Baikal Lake, Siberia. *D. orientale*, as is indicated by its name, comes from the east and is sometimes confounded with the kind called *D. Ajacis*. In the latter the flowers are arranged in long loose spikes forming an erect and spreading panicle. The stem, which rises to a considerable height, is vigorous and pubescent and has open branches. *D. orientale*, on the other hand, has flowers in long spikes upright and closely packed, a glabrous stem branching but little, and upright shoots. In olden times the different varieties of *D. Ajacis* were cultivated in every garden. Among them were single blue, purple, rose, and white, and double kinds embracing all these colours, as well as prettily-variegated sorts, and then there was the kind called *Consolida regalis anglicana*, of which there were twenty varieties of different colours. We have now among garden Larkspurs many colours, but those who have turned their attention to this class of plants, have not specially applied themselves to developing the size of the flowers, to producing double varieties, or to altering the shape of the plant. We possess, at present, however, many large and dwarf varieties bearing single, double, and semi-double flowers, the double kinds being almost the only ones cultivated. All the varieties of the Ajax Larkspur have been collected into three great groups:—1. *Delphinium Ajacis majus* (the large Larkspur).—The stem of this is single, and varies from 3 feet to 4 feet 6 inches in height; the flowers are double, and form a long, single, and compact spike, generally rounded off at the extremity. This kind has produced the following varieties—white, flesh-coloured, rose, mauve or puce-coloured, pale violet, violet, ash-coloured, claret, and brown. 2. *Delphinium Ajacis minus* (small or dwarf Larkspur).—The stem of this is from 20 to 24 inches in height, and even shorter when sown thickly, or in dry or poor soils. The flowers are very double, and are produced in a single well-furnished spike, which is usually cylindrical, rounded off or blunt at the extremity, and rarely tapering. The petals are generally acute at their upper extremity. The principal varieties are

the following—white, mother-of-pearl, flesh colour, rose, mauve, pale mauve, peach-blossom, light violet, violet, blue-violet, pale blue, ash-grey, brown, light brown, white striped with rose, white striped with grey, rose and white, and flax-coloured and white. 3. *Delphinium Ajacis hyacinthiflorum* (dwarf Hyacinth-flowered Larkspur).—The varieties of which this group consists have been for the most part produced in Belgium and Germany. They do not differ at all from other kinds in the form of their flowers, but

only in the disposition of the inflorescence, the spike on which the flowers are set being more tapering, and the flowers themselves farther apart, than those in the two previously mentioned groups. As regards culture, these Larkspurs should be sown where they are to remain, any time after February when the weather will permit, but usually from March to April. They may also be sown in September and October, and even later when the ground is not frozen. The produce of these winter sowings is, however, always liable to be devoured by slugs and grubs. The sowing may be made either broadcast or in rows from 4 to 8 inches apart, and the plants should stand 4 or 5 inches asunder. In gathering the seed care should be taken only to save it from flowers that are perfectly double; single-flowered plants should, therefore, be carefully weeded out if good seed is to be obtained. Larkspurs are at their best between the beginning of June and July, and they will bloom almost anywhere, especially in dry localities, and do not require much attention. They look well either of one colour or of all the colours mixed, and by using varieties possessing different colours separately striking contrasts may be produced.

***D. orientale* (syn. *D. ornatum*).**—This has either single or semi-double flowers, that are violet, white, or rose in colour. It has also produced varieties possessing the same colours as the preceding, and which are generally used for the embellishment of borders, in which they are sown in the autumn or spring.

***D. Consolida* or *Branched Larkspur*.**—This pretty little plant is charac-

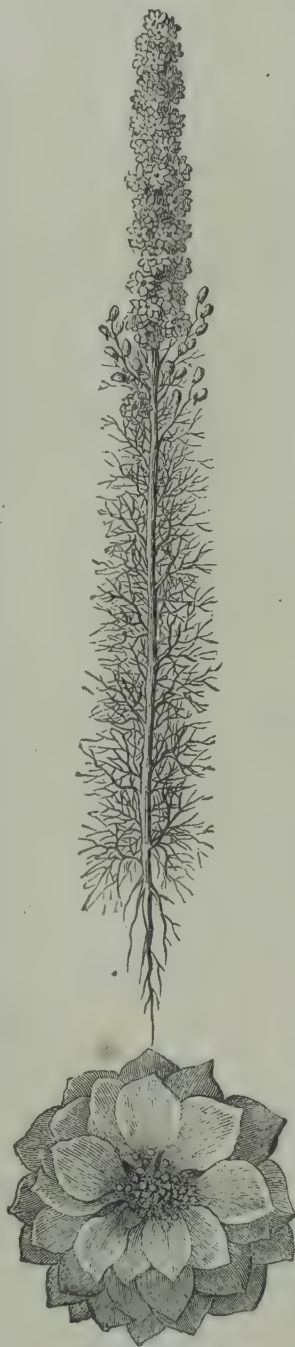
terised by branching stems and by flowers of a beautiful violet-blue hung on slender elongated peduncles. In a wild state, it is always found associated with Venus's Looking-glass, Fennel, and Corn-flowers. It embraces several varieties, both single and double, all of which may be reproduced from seed. The principal sorts are white, flesh colour, red, lilac, violet, flaxen, and variegated. Three varieties of it are especially worthy of being cultivated, viz., candelabrum, a kind that produces beautiful pyramidal spikes of flowers, ordinarily



Two varieties of tall double-flowered Ajax Larkspur.

of a blue colour; tricolor elegans, the form and foliage of which are like those of its type, while the flowers are rose-coloured streaked with blue or purple, and often double; and a variety remarkable for its deep rose-coloured flowers streaked with blue and red, sent out by M. Vilmorin, of Paris. As regards culture, this Larkspur and its varieties should be sown from February to April, either in the open border or reserve garden, and from September to November, leaving between the plants at thinning time a space of 8 inches; if in the reserve garden, they should be transferred to the beds in March when about 12 or 16 inches high, lifting them carefully with balls, in order that they may not suffer from transplantation. This class of Larkspur is specially adapted for the decoration of large gardens either in masses of one or various colours, or it may be planted in borders or amongst clumps of young thinly-planted trees. One great advantage belonging to this variety is that it flowers for a long time and earlier than *D. Ajacis*—that is to say, throughout the summer, and, according to the period of sowing, from the end of June or July to September, and even to October if care be taken to cut off the flower-stems that have shed their blossoms. It succeeds, moreover, in the driest calcareous soils, and even upon declivities and hills. By frequent pinchings dwarf plants of it may be obtained which are very valuable under certain circumstances.

D. cardiopetalum.—This plant grows wild in France, especially in the Pyrenees, and is remarkable for its very branching habit—the branches spreading at first, but subsequently becoming upright, thus giving the plant a bushy pyramidal appearance. The flower-stems are shorter than is the case with the preceding kinds, but more numerous. The flowers are of a beautiful blue inside, and paler and reddish outside, the interior divisions or petals being almost round. This kind is remarkable for the length of time during which it flowers, and for the abundance of its blossoms, the blue colour of which blends agreeably with the brilliant green of the foliage, the latter being thicker than that of other kinds. It succeeds in all kinds of soils, but best of all in those in which the calcareous element predominates. The above is a digest of an article, by M. André de Vos, that appeared in the first number for this year of the "Bulletin Horticole," a useful and well known Belgian publication. For the engravings, we are indebted to the courtesy of Professor Morren, of Liège.



Double-flowered dwarf
Ajax Larkspur.

GENTIANAS.

By general consent these are considered supreme among Alpine flowers for their beautiful hues. Among the Rock Speedwells, and Gromwells, and Harebells, and many other families we have numerous lovely blue and blue-purple flowers, but it is among the Gentians that we find blue flowers that startle us with the depth and brilliancy of their colour, and that sparkle in the early summer Grass as glow-worms do in the dark wood. The Gentians are mostly mountain flowers, or of those open heaths, upland pastures, and wide-spreading bogs, which in northern lands so often enjoy the fresh mountain air and its coolness. Occasionally they haunt the fringes of the stream, as in the case of the Bavarian Gentian, which is so exquisitely beautiful, beside many thousand Alpine meadow-rills in the

Alps of Europe, and the nobler, if somewhat less vivid-coloured Gentians, which adorn the rocks and banks by the great North American rivers and streams. Usually they are dwarf in stature, and compact in growth, but one very common species on the Alps, *Gentiana lutea*, may be classed with the most vigorous perennials. It, however, has not the charm of colour, but the lovely American fringed Gentians, while resembling our brightest European kinds in this respect, surpass them in size of blossoms, and spread forth into sturdy spreading bushes laden with fringed vase-shaped flowers. In a wild state, Gentians do not by any means require peculiar conditions as to position or altitude. The same kinds frequently abound on high snow-clad ranges, hoary in much of their Gentian-haunted surface until far into the early summer, and hills not more frequently covered with snow than the uplands of Britain; generally, however, they love meadows and moisture rather than the rocks or sands, and they crowd most of all into those wide Alpine pastures where they have to struggle for standing room with sturdy little Primroses and silvery Cudweeds and large Violets, that sometimes form an iridescent turf, standing clear above their tiny leaves. In our gardens it is quite possible to enjoy the beauty of the Gentians without much trouble, though these plants are as yet but little grown. They may, from the point of view of culture in our gardens be classed in two sections—the first of strong easily-grown kinds, suitable for borders, and the second of the dwarfer kinds which should be grown on the rock-gardens, or in borders or beds devoted to choice dwarf plants. The *Asclepias* Gentian, some of the American perennial kinds, and those with herbaceous shoots, generally grow freely in good moist soil in borders. So does the well-known *Gentianella* (*Gentiana acaulis*), which, however, being dwarf in habit, and large and splendid in bloom, is used as an edging plant. It is well to form carpets of this in parts of the rock-garden, planting in deep moist loam. The other type of Gentian, represented most familiarly by *Gentiana verna*, is by no means so difficult of cultivation as is commonly supposed. Want of moisture in the soil, want of free exposure to sun and air, and weak and imperfectly rooted plants, are the main causes of failure. In the cool, natural pastures and uplands, where the plant thrives in a wild state, it is rarely subjected to such drought as in a parched, cracked, and baked border. Deep, moist, sandy loam, will suit it perfectly; if the surface be strewn with bits of broken stone it is prevented from cracking and parching as it often does when bare. Well-rooted plants should be secured to begin with. It is important that the plant be not overshadowed or overrun by tall or straggling border flowers. This is easily guarded against by associating with it plants somewhat resembling it in stature. These various conditions observed, the Vernal Gentian will soon spread into strong tufts and take care of itself from year to year, forming carpets on the rock-garden and small beds or edgings on the level ground. The conditions it requires frequently occur in our gardens, particularly in elevated or sea shore districts, and in these it may be grown as edgings to groups of dwarf shrubs, &c. It is quite easily grown in pots or pans of sandy loam plunged to the rim in the open air in a fully exposed spot in summer, and freely watered through the growing season.

FLOWER GARDEN VASES.

SOME people seem to have no conception of ornamenting a balustrade, a terrace, or a stair, otherwise than by vases. Not long ago, in a moderately-sized semi-Italian flower garden, laid out in front of the windows of a substantial but unpretentious mansion, I counted nearly seventy terra cotta vases, all within as many yards of the drawing-room door. Every pier, on terrace and stair, was surmounted by a vase. The place was literally crowded with them, to an extent that one would not expect to see anywhere but in the manufacturer's show-yard, and the overlaid aspect of the scene was monotonous and wearisome in the extreme. A single vase, or even a group of vases, in a well-chosen situation has a pleasing and highly ornamental effect; but when the eye meets them wherever it turns, without discovering the least excuse for their presence,

the impression is disagreeable. The terra cotta vases, now generally used, are well made and chaste in design. They are also very durable, and do not turn green like vases of stone or other material; but to most people the yellowish pipeclay colour is objectionable, as it does not associate well with substantial stone masonry of any kind, while against foliage or a Grass lawn the contrast is still worse. A very popular form of flower vase is the tazza, but it is one of the worst for plants, the basin being too shallow to accommodate the roots of suitable subjects—even bedding plants are starved in them unless watered very frequently, which is not desirable; and I suppose the difficulty cannot be overcome without destroying the proportions of the design. Those, therefore, who desire to fill their vases with noble-looking fine-foliage plants, will do well to consider this before purchasing. The basket-formed vases are amongst the best for plants, and suit low piers and stairs; but they are not so handsome as the tazza, and have too much of the wash-basin form. The common, deep, cup-shaped vase, sometimes ornamented with panels and otherwise, is very handsome, adapted to most situations, and is one of the best for plants. There are some vases made with lids, which must be sparingly used, for they remind one irresistibly of soup tureens. Between these there are many other graceful forms suitable for all purposes. It is not desirable that the vases in and about the flower-beds should be furnished with the same kind of plants as the beds—I mean ordinary bedding plants; or, if they have to be used, they should be mixed and arranged in such a way as to afford a contrast. Some of the succulent class are well adapted for vases, and none surpass the *Echeveria metallica*, but the plants must be large—two or three-year-old plants, with good leaves; and single plants look best in moderate-sized circular vases. If the flower-spikes are encouraged to grow, the effect is much better, and, indeed, unique and striking. The *Sempervivum arboreum* is a tall symmetrical plant for a vase, but too stiff for some situations. Large plants of *S. canariense* are better for the purpose, and very interesting, and so is *S. giganteum*. The American Aloe, the green and variegated kinds, are very suitable, and general favourites with most people. *Yucca aloifolia variegata* is another excellent species when well furnished to the bottom. The hardier *Dracænas* are all first-rate vase plants, being wiry and enduring, as well

as ornamental. *Phormium tenax* and *tenax variegatum* are also amongst the best, especially the latter, its spreading fan-shaped form filling up the position well. In all cases the top of the plant should be in ample proportion to the size of the vase. A shabby plant in a fine vase looks ridiculous. Any of the Palms which are hardy enough for outdoor summer

work look well in a vase. *Latania borbonica* is one of the most useful and hardy. Most of the free-growing sub-tropical plants now in use may also be employed; but, as vase plants are frequently exposed to the wind, tender-foliaged subjects are disappointing. The Japanese variegated Maize, for instance, is a splendid vase plant, but the leaves get torn to ribbons with the wind; for fountain work in sheltered places it is matchless. Of formal-looking plants, I have used specimen Azaleas, putting them into large vases during summer, instead of on the border outdoors, as usual. If healthy and green, they look really well. The spire-like Juniper, also, is very effective in vases that are not too wide. *Centaurea gymnocarpa*—good large plants from sowings of the previous summer—is also effective, and as easy to get up as any. With some people the *Humea elegans* is a favourite; but, though it does well in a bed, it is a spare subject in a vase, and the foliage is seldom good, which gives it a starved appearance. Of flowering plants, the Fuchsia is one of the best; and spreading bushy plants, that have been cut down once or twice, and that will throw up a mass of shoots like *F. Riccartoni*, will be found by far the most useful and least troublesome to grow. None of the above-named species want much, if any, decorating by planting small plants around their stems or on the surface of the vase; they look better alone. A surfacing of *Lycopod* is, however, not objectionable about *Dracænas*, &c., if they are somewhat long-limbed. I have surfaced the soil of the shallower vases with patches of ground Moss (pegged on to keep the birds from disturbing it) to prevent evaporation. Ivy of the *maculata*

type, and also the common kind, may also be employed with good effect as a drooping plant, but the plants should be lengthy and supple when planted, as they do not grow much in vases. Periwinkle, also, is useful for carpeting the surface of the vase, and has a refreshing appearance; indeed, no creeping or trailing plant comes amiss that will grow, and they should be planted profusely. Vases are often employed with



Double Ranunculus-flowered
Larkspur.



Double dwarf Hyacinth-flowered Larkspur
(see p. 459).



good effect in secluded and appropriate corners of the lawn and shrubberies. In such situations these decorations should be rather different; a little colour is necessary for contrast, and the usual bedding-plants will effect this. For the centre of a vase a good group of tall one-year-old scarlet or pink Geraniums is well adapted, and round the margin the vase may be trimmed profusely with Calceolarias, Lobelias, Heliotropes, Mignonette, &c. The great point is to plant thickly at the first. Fill up the middle with the central plants, forming a good bush, and afterwards plant the sides with the smaller subjects. Deep vases should always be well drained, and, in planting, one or two inches should be left for watering, as, when they are filled too full, the soil gets washed over upon the piers and steps. An open, rich, loose soil is the best, for in vases the earth is apt to cake in dry weather, and it should not be rammed hard about the roots when planting is performed. I always use a rough compost of leaf mould and turfy loam. Before frost sets in all stone or earthenware vases should be emptied, as the expansion of the wet soil by freezing is apt to crack them.—“Field.”

MULCHING IN THE FLOWER GARDEN.

DURING hot dry weather vegetation frequently suffers more from heat and drought on strong land—from its tendency to crack into deep fissures, and thus part rapidly with its moisture—than on light sandy soil, where the surface remains intact. There is, too, a vast difference in the power of various soils, often even in the same locality, to absorb heat during bright sunshine, and it is on those soils which, either from their colour or composition may be termed hot soils, that the value of a thin covering of some non-absorbent retentive substance will be most appreciated. For several years past I have mulched nearly all the beds in our flower garden, and with the most satisfactory results. In the case of all plants which are benefited by a little extra nourishment, we mulch with short manure; but in the case of others, that usually make growth enough without any such support, we simply cover the beds thinly with short Grass, from which the plants derive much benefit, and the saving of labour in watering is very considerable. Indeed, I do not think that any amount of watering would produce the same result, because it tends to encourage surface rooting, and, every now and then, something occurs that for a short period, at least, prevents the accustomed supply being given, and, in a hot soil like ours, the young surface roots soon perish; where, however, the beds are mulched there is no occasion to feel uneasy about the water supply. In most cases it is best to put on the mulching as soon after planting is finished as is convenient. Verbenas, Violets, Ageratums, Calceolarias, Heliotropes, Iresines, Coleus, Tricolor Geraniums, &c., we mulch with manure decayed sufficiently to break up easily with a fork. I have generally used horse manure, but last season I obtained it from a bullock-yard, the manure from which is of a cooler character than that from stables, and better suited for a hot soil. The expense of the manure compared with the well-being of the plants and the saving of labour in watering, is a mere trifle. We turn out annually from 40,000 to 50,000 plants, exclusive of such as are hardy, and about five one-horse loads of manure suffice to mulch all that require such assistance. It should be placed evenly all over the surface of the beds with the hand, and where the appearance of the manure is objectionable, about an inch of fine soil should be placed over it, and all plants that require pegging down should receive that attention in good time. Pelargoniums of the scarlet section will stand a good deal of drought in a deep soil; but in hot summers a thin covering of short Grass or Moss is a great help to them, and, if put on in time, will prevent their losing their lower leaves. This class of plants usually makes growth enough, and, therefore, all they require is some thin covering to check evaporation. Petunias, when once established, even on the hottest and driest soils, never seem to require either watering or mulching; a dry hot season, in fact, suits them best, and very showy inexpensive beds they make when trained low on sticks bent over the beds.

E. HOBDAV.

Ramsey Abbey.

FRAGRANT ROSES.

THE Rev. J. B. M. Camm makes a sensible plea for these in the “Journal of Horticulture.” “I am afraid,” he says, “that fragrance is the last qualification that Rose-fanciers consider, and if raisers produce a Rose of first-rate form, good, distinct, and pure colour, strong in growth, and erect in habit, they consider that they have deserved well of their country, and that if the said Rose is quite destitute of fragrance the matter is of no importance. To a certain extent they judge rightly; for judges at exhibitions rarely, if ever, take the fragrance of the stand into account. I fancy I see the countenance of any of our leading judges (I do not like to mention names), if asked in the case of a disputed and difficult point of judging, to give the preference to the stand containing the most fragrant Roses! Yet, other qualities being equal, it would not be a bad way of deciding a vexed question. I remember the Royal Horticultural Society once gave prizes to Roses to be judged by their perfume, and I have still a catalogue in my possession where, on the outer sheet, the proprietor proudly informs the public that at this show he gained the first prize for “six Roses for smell;” but, alas! among other changes—notably that of refusing to pay the prize money—this is included, and the classes for perfume are withdrawn; so that there is now no encouragement to growers to cultivate Roses celebrated for their fragrance. I remember once, at Hereford, the Marquis of Bute gave a £5 prize for twelve best York-and-Lancaster Roses, but the competition was so small that the committee persuaded him to transfer his prize to table decorations. So fragrant Roses are left out in the cold, and we live in hopes that some of the larger societies or wealthy amateurs will offer a prize for this class at one of the great exhibitions. Now, as to fragrant Roses. Here, again, by far the best are the Tea Rose, and if I am asked to name the most fragrant Rose, I should say Devoniensis, and next place my own particular pets—Catherine Mermet and Madame Bravy—or Alba Rosea or Madame Sertot, as she is variously called. Souvenir d’Elise, the most lovely of all Teas, has a most distinct and peculiar fragrance like that of fresh tea, and though not so pleasant as the first-named, yet is equally sweet-scented. Maréchal Niel and Triomphe de Rennes possess a large amount of perfume, while Madame Willermoz reminds one of the most delicious fruit. This Rose, though rarely shown in perfection, is for fragrance almost unrivalled. Cloth of Gold is also very sweet-scented, and Rubens and Souvenir d’un Ami delight you with their perfume as well as charm you with their form. In fact, all the above-named Teas are good in every sense, and rarely, if ever, fail to bloom early and late. Of Hybrid Perpetuals it is difficult to give a list, as the majority of this latter class possess most exquisite perfume; but I can name a few which are remarkably good. Général Jacqueminot, among the dark Roses, is pre-eminent for perfume, and La France among the light. Abel Grand, too, is a most fragrant Rose; and that charming little button-hole Rose (which does remarkably well here), Boule de Neige, has a most sweet and distinct bouquet. Beauty of Waltham, among the light crimsons, is very fragrant, and Comtesse de Chabillant among the light pinks. Madame Furtado, that poor weak grower, whom I almost despair of ever seeing in her beauty, is most celebrated for her perfume; and Charles Lefebvre, the grandest of dark Roses, is also very sweet. The foregoing is an imperfect list, but if I were to name all the fragrant Roses I should want far too large a portion of your space; I have, therefore, only mentioned a few which in my opinion are most fragrant, and I hope other rosarians will supplement my list, and thus make an opening for another election of Roses, viz., those celebrated for their perfume.”

EFFECTIVE SPRING GARDENING.

I do not think I have ever seen anything more beautiful than the effect produced by my spring beds this year, and yet they are, without a single exception, composed of flowers which are most readily propagated, and within the reach of everybody. In the lower garden the lawn is an irregular square, with the corners rounded off; at each corner is a bed, about 17 feet long, and 3 feet 9 inches broad, placed about 3 feet from the margin, and following the curve of the lawn. These beds are divided into diamonds and half-diamonds, by a band of *Arabis lucida variegata* in the case of one opposite pair, and of *Golden Feather Pyrethrum* in the case of the other. Each bed contained three whole diamonds, with their corresponding halves, and a half-diamond at either end. In the case of one, the centre diamond is filled with Ware’s Cloth of Gold Pansy, and has on either side of it a diamond of Pansy Black Prince. The half-panels at either end contain Pansey Clevedon White, and these are flanked by corresponding half-panels of pink Daisy, the two remaining half-panels being filled with red Daisy. Nothing can be richer than this bed, which is solid with, I might say, thousands of blooms. The gold in

the middle, flanked on either side with crimson, and abutting again on the rich dark purple of Pansy Black Prince, is most striking; while the pink Daisies and white Pansies at either extremity, and, not least, the clear soft band of Arabis intersecting all, give a quietness to the whole which is very charming. The Daisies have been in flower for three months, and the Pansies for six weeks, and they are still one solid mass of bloom. The other beds are somewhat similar, but varied in their details; Myosotis, Pansy Magpie, Clevedon Blue, and others, being used to set off the pink, white, and red Daisies. I plant very thickly in October, manure heavily, and water occasionally with liquid manure.

In the upper garden I have a border, about 50 feet long, and 7 feet deep, planted in panels, V and A-shaped alternately, with similar materials, and intersected with the same Arabis, the effect of which is equally good. The masterpiece of all (while it lasted) was, however, a raised round bed, about 24 feet in diameter, situated in a conspicuous position. This was filled with 300 crimson Tulips (*Rex rubrorum*), and carpeted all over densely with *Cerastium tomentosum*. This was simply perfect, until the rain spoilt the Tulips; the *Cerastium*, with its soft grey foliage, contrasted most effectively with the brilliant bloom of the Tulips. I am now breaking up those beds to make room for their summer occupants, but I do so with reluctance, as they are still beautiful and bright, and will, I know, never be equalled by any compilation of Geraniums and Lobelias, which have needed so much attention all the long winter.

H. MILLINGTON.

Flowers on Railway Embankments.—Mr. Fish asks (see p. 450) whether the Primroses sprung up, on the bank to which he refers, naturally, or were intentionally sown there. I have no doubt that, in forming the bank, either seeds or roots were carried there along with the earth or turf. I can refer to a place on the North Kent line, near Erith, where a vast quantity of Valerian gives the bank a beautiful appearance in its season. As trespassers are pretty well kept off railway banks, a self-sowing plant is almost sure to spread, and such spaces may be easily rendered beautiful with little trouble or expense. The other day, in Staffordshire, I saw a bank blue with wild Hyacinths, and a few red Poppies before their natural season. Some thirty years ago, I tried sowing some Poppies on a bank of the South-western; but none appeared. I may

ask whether, as collectors are extirpating the varieties of wild Orchids, some could not be planted on railway embankments?—J. S.

Tuberous-rooted Begonias.—These plants are so fresh when in a young state, and bloom so freely, and, moreover, are so easy to cultivate, that they deserve a place wherever beautiful half-hardy flowers are grown. They are great favourites of mine, and the following kinds are all good and distinct:—Glitter is a vivid orange-scarlet variety, of good habit, and a profuse bloomer; the flowers are rather small, but this is amply compensated for by its brilliant colouring. Lothair, a soft rosy variety, with just a tinge of lilac, is

very beautiful. Masterpiece is one of the largest and best of the scarlet-flowered kinds, the blooms being of good substance. Lucinda is a very effective variety, bearing delicately-formed rosy-lilac flowers. Anacreon bears pointed blooms, of a remarkably rich tint. Apart altogether from their value as greenhouse decorative plants, however, they are very useful for dinner-table decoration, as both leaves and flowers show well under artificial light, and, for this purpose, plants about a foot high, grown in 48-sized pots, are best.—J. H. C.

New Hybrid Hellebores.—The following have been obtained by crossing *H. abchasicus* with *H. guttatus*, and others. Their superiority over older varieties consists in improved form, more floriferous habit, larger and finer flowers, of more distinct colour. Dr. Koch, referring to these seedlings in the pages of a contemporary, says:—"I am convinced that at the time of year at which they bloom there are no more beautiful or more useful plants than these hybrid Hellebores, which originated in the Berlin Botanic Gardens." Messrs. Ant. Roozen & Son, Overveen, near Haarlem, who will offer them in the autumn, have kindly sent us the following details respecting them:—No. 1. Flowers beautifully



Double-flowered Branched Larkspur (see p. 459).

formed, 3 inches in diameter, bright dark purple and rose colour, with numerous carmine-red streaks; a rich and early variety. No. 2. Remarkably fine flowers, good in form, stately, and raised well above the leaves; petals finely cut and curved, very large, often 3 inches in diameter; colour, pale brown and purple-rose, with numerous sharp, dark carmine-red spots; a showy variety. No. 3. Flowers excellent in form and attitude, large and abundant purple-rose. No. 4. Smaller flowers, but in other respects the same as No. 3. No. 5. Flowers large and flat, fine

in form, 3 inches in diameter, colour snow-white, a fine kind. No. 6. Flowers pure white, from 2 to 3 inches in diameter, showy and effective. No. 7. Finely-formed pure white flowers spotted with red. No. 8. Flowers large, finely-formed, snow-white spotted with red; a fine variety. No. 9. Like the last. No. 10. Flowers white spotted with red, like seedling No. 7. *Præcox major*, flowers snow-white, earlier than all the others, and very free flowering.

Hardiness of *Primula japonica*.—This *Primula* has proved quite hardy with me throughout the winter, and it is a very effective spring bedding plant, but requires to be massed to produce the best effect, as, unless the plants have formed good strong crowns in autumn, they will only produce one spike of bloom the following spring. Your correspondent, "H. T." (p. 373), will find that the foliage of this *Primula* always dies down in autumn when the growth is matured (either in pots or planted out), and it will remain dormant for a considerable time. It is capable of withstanding heavy rain and wind without being staked, the flower-stalks themselves being as strong and wirey as many stakes that could be found, and therefore the unsightly appearance of the latter may be avoided altogether. It receives the same treatment with us as the other spring bedding plants, and yet I hope to see our borders and shrubberies glowing through the spring months with the brilliant hues of this lovely flower.—R. GREENFIELD, *Priority Gardens, Warwick.*

Culture of the Flame *Nasturtium* (*Tropæolum speciosum*).—Your correspondent, "S. R.," inquires (see p. 395), if this beautiful climber will answer on a low terrace wall facing due south. We find in Scotland that it succeeds in any aspect; and the longer it is established, the more effective it becomes. A cool, but genial soil is probably the main condition of success, and it certainly appears to prefer a moist climate. Here, in the south-west of Scotland, it increases very rapidly, and is a great ornament to shrubberies and Ivy-covered walls, both from its graceful foliage, vivid blossoms, and bright blue berries. I would recommend your correspondent to get his plants well established in pots, and then to plant them out in a cool and somewhat moist border, where they may climb on shrubs, a hedge, an Ivy-covered wall, a trellis, or on any other kind of support. They will not make much show the first year; but it will be seen in the following season whether they can take care of themselves. If so, well and good; "S. R." will have made a valuable addition to his hardy plants. If not, it is not worth taking further trouble in the matter, as this plant is nothing if not luxuriant.—SALMONICEPS.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Growing the Edelweiss near London.—As there was some discussion some time ago in your columns about the possibility of growing *Gnaphalium Leontopodium* (Edelweiss) in the London suburbs, I would mention that a plant of it, sent me two years ago by Messrs. Backhouse, is now growing strongly and has fine flower-heads on a little rockery where London fogs play havoc with many Alpine plants.—J. R. DROOP, *Stamford Hill.*

***Daphne Cneorum*.**—This *Daphne*, though well known, is not nearly so often met with as it ought to be. It succeeds planted out in ordinary soil, and in pots is well adapted for conservatory decoration. Its branches layer themselves, and only need to be taken off and planted or potted. Its rosy flowers are pleasantly scented.—J. MURR.

A Vigorous *Marechal Niel* Rose.—Last autumn I budded this upon an old-fashioned wall Rose, and late this April it started into unusually vigorous growth. It has already grown 4 feet in height and is still steadily progressing at the rate of $1\frac{1}{2}$ inches per day. One leaf petiole measures $10\frac{1}{2}$ inches in length and $8\frac{1}{2}$ inches across the two centre leaves. The largest single leaf measures 5 inches by $3\frac{1}{2}$, and all the foliage is equally vigorous. Is not this extraordinary, and may I expect flowers of proportionate size?—W. A., *Gloucester.*

Maiden-hair Fern in the Isle of Man.—On the 4th ult., I found *Adiantum Capillus-Veneris* growing in moderate abundance on the west coast of the Isle of Man, near the village of Glenmayo. The young fronds were just peeping from the opening in the rocks, some 10 to 15 feet above high-water mark. I mention this fact because I have noticed that several writers, in alluding to this Fern, have confined its occurrence to the more southern parts of England and Ireland.—H. J. MARSDEN, in "Science Gossip."

***Anemone japonica alba*.**—In your interesting article on the Windflowers (p. 423), there is a mistake which ought to be rectified. *Anemone japonica alba* is said to be synonymous with A. J. Honorine Jobert, which is not correct, as the latter is a very superior flower to the other; the mistake as to the identity of the two occurs, however, in more than one herbaceous catalogue. It may be also interesting to know that there are two varieties of *Anemone* (*Hepatica*) *angulosa* in cultivation, one having broader petals than the other. The engraving of this species represents the inferior sort.—R. P. B. [*Anemone Honorine Jobert* is a sport from A. *japonica*. Its origin has been fully given in our last volume (see p. 498).]

Saving Dahlias from Slugs.—As the time for planting Dahlias is at hand, let me entreat your readers to beware of slugs. After planting, press close the earth near the stems, that an enemy may not remain concealed to bark the stem all round and kill the plant. Dust a little lime close to the stem; it is of no use elsewhere. Repeat the dose after every shower until the plants grow beyond the power of their enemies. Sow a little Lettuce seed—say a dozen seeds—round every plant; the slugs will feed on them and not touch the Dahlias. By-and-bye, hoe out all but one of the Lettuces, which will be useful.—GEORGE RAWLINGS, in "Gardeners' Magazine."

THE INDOOR GARDEN.

TUBEROSES IN MID-WINTER.

To have Tuberoses in at Christmas, and on New Year's Day, the following course is pursued in the United States, where Tuberoses are admirably grown:—By the 20th of August they are potted into 4-inch pots, containing a composition of two-thirds strong loam and one-third old rotten manure. They are then planted out of doors in a frame, as close as they will stand until the end of September, when the centre table of a span-roof house is bored with a number of holes to let up the warm air from underneath, and the Tuberoses are planted out on this. It is necessary to have three or four hot-water pipes underneath the table, and the compost ought to come, if possible, from an old pasture. To every two barrows, one barrow of old hotbed manure is added, the whole being well mixed together, and then placed upon the table to a depth of 5 inches, and well pressed down with the feet to give solidity. The Tuberose does best on a heavy rich soil. The bulbs are then turned out of the pots, and planted in rows 6 inches apart, and 6 inches from plant to plant, and thoroughly watered with the hose. The plants are well syringed, and, on the first appearance of frost, a moderate night temperature of, say, 60° should be maintained. By the 6th of November, the plants will be well established, when the night temperature may be increased to 70°, and abundance of moisture used, the path of the house being flooded at night. Sulphur, worked into the consistency of thick paint, is put on one of the hot-water pipes, as a preventive against red spider, the great enemy of the Tuberose. If the plants have been managed properly, they will commence to flower by the middle of December. At Christmas, they command from £1 to £1 12s. per hundred florets, each plant or bulb producing from thirty to forty florets at these prices. The following practice is usually adopted, and is, I think, the most practicable for the spring crop:—A hotbed, or better still, a pit, is prepared in a similar way to those for Melon and Cucumber growing in England. As soon as the rank steam is off, 3 inches of coal ashes are put on, and the bulbs potted as previously directed, selecting those that are thick at the neck. Some think a very large bulb is best; but I think those of medium size are preferable. First-class bulbs sell at £10 per thousand; those of second quality, £7 per thousand. The pots are plunged to the rim in the bed, and there is no danger of their rotting from the heat, which they will bear well. Linings are added as soon as the surface heat declines, the night temperature being kept at 60° and the pit covered up well at night, mats and shutters being used; in a month or five weeks, they will have their pots well filled with roots, have dense foliage, and they are then ready for the house. The first crops by this time are gone. Having planted out as before recommended, plenty of water must, as the spring advances, be given to the plants in the bed. Morning and evening a syringing must be given with the hose to prevent red spider. Should the plants come near the glass, they must be tied down. Thus treated, they will in part commence to flower by the end of April. The florets sell from 12s. to 16s. per hundred, and, by June 1st, they are down to 8s. per hundred. Even at these prices I have known £200 made of the plants grown on the centre table of one house, the table measuring 88 feet long by 6 feet wide.

JOHN HOWATT.

USES OF SPENT TAN IN GARDENS.

M. G. ERMENS, writing in the "Revue Horticole," makes known some of the results obtained by the use of this material in Paris. He has used it in his propagating-houses for several years, and when done with there it is further employed as follows:—In April numbers of plants, to be afterwards used for the decoration of the squares and parks, are removed from under glass to be hardened off and planted out in the end of May; others are re-potted, and plunged in beds under Thujas, part in tan and part in sand; each plot is 6 yards in length, $1\frac{1}{2}$ yards in width, and in each are placed an equal number of plants of the same kind, and under exactly similar conditions. The result has been, that by the end of June those which were placed in tan were very superior to those in the sand; the roots which, in every case were abundant, filled the pots, a circumstance that accounts for the vigorous appearance of the plants as compared with those placed in sand. At the end of May there still remained some sheltered beds at command; and the whole of them were filled with old tan, in which *Dracænas*, *Latania*s, *Chamærops*, *Begonia*s, *Curculigos*, *Aspidistras*, *Musas*, *Ficus*es, *Caladium*s, and various other plants were plunged. In autumn these plants were in remarkable beauty, and every fortnight or three weeks it was necessary to move the pots to prevent the too great development of the roots in the tan. It was also found that less

water was needed in the tan beds than those of sand during severe heat; the latter required three waterings a-day, whilst two were sufficient for the tan, and, ordinarily, only one—a fact which may be accounted for by the retentive character of the tan; the sand, on the other hand, allowing the water to percolate through it. In 1865 M. Truffaut's fine collection of Amaryllids came under M. Ermens's care, and he had an opportunity of again ascertaining the good effects resulting from the use of tan as a plunging material, for the Amaryllids placed in it produced plants of fine roots and flowered magnificently. Each year, when re-potting the Amaryllids, all the bulblets were preserved and planted out, care being taken to cover the whole with a layer of tan as a mulching, and, under this treatment, numerous roots soon made their appearance. The borders and clumps planted with Cannas were every spring mulched with tan to a depth of about 1½ inches, and with no great advantage to them. New tan was, however, never used, but simply the refuse of the forcing-houses.

Poinsettia pulcherrima Planted Out.—In America, old plants of this are cut back by the middle of April; if at all straggling, they must be cut in boldly. It is not necessary to have a portion of last year's wood; they will break no matter how low you cut back, and a neater appearance is given to the plants; they are then shaken out thoroughly and re-potted into 7 or 8-inch pots, the compost in which should be one-third fresh loam or heavy clay, one-third rotten manure, and one-third old Hops and manure passed through a coarse sieve. The plants should be kept in the house until they have well broken, when they are turned out-of-doors and plunged in ashes or sand to the rim. As soon as they fill the pots with roots they are re-potted into 12-inch pots or, if the plants be old and require it, into larger ones. By the end of June all the strong shoots at the top should be pinched; they give you two or three shoots, and, as a consequence, more bracts in the winter. By the 20th of September they are moved into the house, taken out of their pots, and planted out on the tables, either upright or laid on their sides in a sloping position. If the latter course be adopted the rays of the sun will soon bring them to an upright position. An abundance of air during the autumn months should be given; as soon as frost sets in, or during the early part of November, the night temperature should be 60° at night, and from the middle of November to Christmas this is increased to 70°. This temperature is necessary to open and bring the bracts to perfection. They are sold by the thousand to the New York florists about Christmas and New Year's Day, with an increasing demand for them from the western cities. They realise from £3 to £5 per 100 bracts. As soon as the flowers are all cut, they are taken up, and heeled in under the benches; the soil taken off the latter and used for potting bedding plants for spring sale. The Poinsettias are again cut back in April; the wood cut into short lengths, put in thickly in the hottest part of the propagating-house. As soon as they are rooted, they are re-potted, grown under glass all summer, and are sent to the Western States in the autumn. In the largest establishments, you can seldom, at any time, find many on hand, the demand being greater than the supply. Mr. Peter Henderson, of Bergen, is one of the largest growers of Poinsettias around New York, and he also devotes part of his establishment to the production of Rose-buds.—J. H.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Adiantum speciosum.—This is a very elegant Fern of semi-scandent habit, furnished with large tripinnate fronds, which frequently attain a length of 36 and a width of 21 inches. The whole of the pinnules are covered with dense short hairs, which give the foliage a woolly feeling when touched. This beautiful plant is very distinct from any Adiantum in cultivation, and has the peculiarity of being deciduous. It formed one of a collection of six new plants with which Messrs. Veitch won the first prize at the great exhibition of the Royal Horticultural Society in 1873, and it is in all respects a Fern worthy of cultivation.—B.

Succulents in Bloom at Sudbury House, Hammersmith.—I have thought that it might interest some of your readers to know that the following Succulents are now in flower here, viz.:—*Cereus pectiniferus*, p. *Hornarii*, *speciosissimus*, *leptopus*, *Mallesonii*, *flagelliformis*; *Echinopsis Schellhassii*, *oxygona*, *amena*, *Zuccariniana*; *Mammillaria polyedra*, *recurva*, *centricirra*, *glochidata*, *Wildiana*, *sphaeracephala*, *euberimana*, *polygona*, *villifera*, *meyacantha*, *Hystrix*, *mutabilis*, *Fischerii*, *centrispina*, *pyrocephala*; various kinds of *Phyllocactus*; *Echinocactus multiflorus*, *Wanderayii*, *Kochii*, *bicolor*, *myriostigma*, *mammillosus*; *Aloe nobilis*, and many species of *Gasteria*.—J. CROUCHER.

Panama Hats.—*Carludovica palmata*, the young, unexpanded leaves of which are so largely used at Moyobamba and Guayaquil in the manufacture of Panama hats, is called a Palm, but it is more properly a Screw Pine. It has no stem; the leaves are long and on slender petioles, springing from the ground. They are about 2 feet long, fan-shaped and four-parted, each segment being again ten-cleft; so that when folded in venation, each segment on its own rib, there are eighty layers in a young leaf. It occurs only on the slopes of the Andes.

EDIBLE CACTI.

AMONG the various families of plants, the Cacti would, at first sight, be considered the least useful in an economic point of view, however singular and characteristic they may appear. And yet even these grotesque and spiny plants are not without their good uses to man. To say nothing of *Opuntia tuna*, *O. coccinellifera*, and *O. Hernandezii*, being the chief support of the useful Cochineal insect, and of their forming such admirable, impenetrable, and unflammable hedges in tropical countries, their edible uses are not to be overlooked. A dye can be prepared from the pulp of several species. Among the foreign fruits occasionally imported are small quantities of the Barbary Fig, as it is sometimes termed, although usually spoken of in the tropics as the Prickly Pear. The fruits of many other Cacti are, however, edible; and a brief notice of some of these may prove interesting. We will commence with the most common, *Opuntia vulgaris*, the fruit of which, from Algeria, and other parts of the Mediterranean and the West Indies, reaches Covent Garden, but seldom or never in perfection, so as to give any idea of its true flavour; and, moreover, we have numberless fruits of our own temperate climate which are far preferable. It is, however, in Italy that this fruit is chiefly appreciated. It formerly furnished one of the principal food substances in the Canaries. In Sicily, *Opuntia Ficus indica* is eaten, and widely cultivated, especially in the territory of Caltagirone, in the province of Catania. Of late years, it is cultivated there in rows as in Palermo; and there were, some ten years ago, upwards of 10,000 acres under culture with this Cactus, chiefly alone, or mixed with the Olive. The reason for this extended culture is the increasing demand for the fruit, both in town and country. At the period of their ripening, that is from November to January, the citizens assemble after dinner in the faubourgs of Santa Maria, of Fontanelle and St. Bartolomeo, to proceed in company to enjoy themselves by a repast of these delicious fruits. On Sundays, also, whole bands of artisans will proceed to the farms in the vicinity of these faubourgs to purchase and consume them. A couple of acres of land, if within a mile or a mile and a half of the town, yield an annual return of nearly £16 from this fruit.

A correspondent of one of the daily papers, writing recently from Corsica, states that the fruit is as much relished there. "It was an amusing sight just now to see a mother feeding her four children, all sitting on their haunches in open air, from a basket of Barbary Figs. I was puzzled at first at the gloves, the pocket-handkerchiefs, and the evident desire to clean the fruit of every particle of rind; but, happening to try one myself, I found that every hair of the soft, furry-looking substance outside was as sharp as a needle, penetrated fingers, lips, and tongue. We are taught by experience; and though Barbary Figs are sold at ten a penny, I shall not be inclined to try them again."

There are three or four varieties of this Cactus known in the locality—1, one with yellow fruit; 2, one with white fruit; 3, one with red fruit; and, lastly, one without seeds. It flowers in May and June, as does also another species; *O. amyclea*, Tenor., of which the fruit is also edible, but is less cultivated. The two first-named varieties are those which are chiefly grown because they are more productive, and the fruit is sweeter and larger. They are always most esteemed by the customers, and hence there is a continual increase of the demand for those Figs with yellow and white pulp. The retail price necessarily varies with the season and the abundance of the crop. In the month of September the earliest fruit will sell about a dozen for a penny, in October twice that quantity may be had; and, at a later period of the season, in December and January, their value will run up again to about six for a penny. With respect to keeping during the winter, those with yellow and white pulp hold also the first place. They may be preserved to the end of February on a layer of straw or hay, or on tiles if not removed from the branching leaves. In this way they may be kept good even till the end of May by covering them with hemp stalks or tow, or paper to protect them from frost and the attacks of insects. These fruits, which are largely consumed by the labourers when ripe, must necessarily be wholesome, as they contain much mucilage and sugar; they are eaten either alone or with bread. They cannot be successfully made into marmalade, as the heat is against it. The skin of the fruit is given to domestic animals, horses, mules, and asses, either alone or mixed with straw or hay. The spoiled fruit serve to fatten pigs, who are led about with a cord attached, to feed on those fallen to the ground. Alcohol is obtained from the refuse fruit by a rude process. They are first boiled, and then submitted to pressure to extract the juice, which is left to ferment in a wooden vat for about six days. It is then distilled, and the unpleasant odour removed by filtering through charcoal. The refuse fruit only cost about 1s. 3d. per cwt., and these give 50 per cent. of their weight in juice, and this, when submitted to the distillation, yields 2½ per cent. of spirit. The two varieties with white and yellow fruit sometimes present

examples of hybridisation. The variety with the scarlet fruit is cultivated with the others, but only in small numbers, as the pulp stains the lips in eating. M. Labouret, in his "Monograph on the Cacti," states that this variety is found without seeds, but this is not so in Sicily. The expense of cultivation is very slight. The plant requires no manure, but merely a little loosening of the soil annually, in December, at an expense of about £1 per acre. There are usually other crops raised between the rows of Cacti, either Wheat or Barley.

The fruit of *O. Engelmanni*, *O. vulgaris*, *O. camanchica*, *O. Rafinesquii* (the most northern of all the species), and *O. occidentalis*, is much eaten by all of the Indians of New Mexico, Arizona, California, and Utah, under the common Spanish name of "Tunas;" great quantities being dried for use in the winter. The fruit are large, and of a bright red to purple colour; of a rather pleasant, sweet, and somewhat acid taste; and have thin skins, and rather large seeds, which are discarded. The skin is studded with bunches of very fine downy spines, which the Indians brush off with a bunch of Grass. The Apaches use wooden tongs to gather the fruit, to prevent being scratched by the spines or thorns of the plant. The Pawnees and Papajoes dry the unripe fruit of the *Opuntia* for future use, to be cooked with meal and other substances. The fresh unripe fruit is often boiled in water from ten to twelve hours until soft; then, being allowed to ferment a little, it becomes stimulating and nutritious. Some Indians roast the leaves or branching stems of the *Opuntia* in hot ashes, and, when cooked, the outer skin, with the thorns, is easily removed, leaving a slimy, sweet, succulent substance, which is eaten. A San Francisco paper published recently an interesting account of the economic applications of some of the Cacti in the north-west parts of America. The giant or monumental Cactus (*Cereus giganteus*) is a noted plant of the barren hills of Arizona. It grows 25 to 50 feet high, and 4½ feet in diameter, is deeply ribbed, and covered with long black spines. Its fruit is Pear-shaped, of a greenish-yellow colour, with a few small spines scattered over the surface, which fall off as the fruit becomes thoroughly ripe. The fruit is borne upon the highest part of the plant, and is usually gathered by means of long hooked sticks. The interior of the fruit is of a beautiful red colour, and looks tempting; the rind is pulpy, porous, juicy, and sweet; the pulp is very palatable, and is full of small black seeds, which are also eaten, reminding one of Figs, the only difference being that it has more moisture. The seeds are indigestible, unless well masticated. The Indians of Arizona, Sonora, and the southern portion of California consider this one of their greatest luxuries, and, as long as the fruit is obtainable, care for nothing else. To dry this fruit as a preserve, the seedy pulp is placed between the soft inner sheathing husks of the Maize-cob, the ends of which are tied, and it is then dried in the sun for winter use or trade. It is also put into earthen pots when fresh, secured from the air, and sold in the settlements. It retains its sweetness for a long time. A clear, bright-brown syrup is expressed from the pulp, and sold in gallon jugs, also made by the Indians, at from 2 to 5 dollars. The Papajo Indians are the largest producers of this syrup. The Pimo Indians of the Gila river annually prepare a wine from this fruit, called by the Mexicans *tiswein*, by taking the first pulp or the syrup, and mixing with it a certain quantity of water in earthen vessels, and expressing it to the same for some time to ferment, after which it is fit for drinking. It is highly intoxicating, with the taste and smell of sour beer; but some time elapses before its stimulating effects are felt. When the wine is ready for use, the Indians celebrate their annual drinking festival. These gatherings are anxiously anticipated for months, and expeditions, which have been planned against the Apaches while under the influence of drink, are then carried into execution. It is a clear amber colour, and is in every respect superior to much of the wine on sale in California.

Thurber's Cactus (*Cereus Thurberi*) is commonly called Pitahaya by the Mexicans. It grows in the Papajo Indian country, on the borders of Arizona and Sonora 18 to 20 feet high, and 4 to 6 inches in diameter, and bears two crops of fruit for years. The fruit is of the size and shape of an egg, and is thickly covered with long black spines. As it ripens it becomes tinged with red, the spines fall off, the fruit splits open and exposes a rich red, juicy pulp, with small black seeds. This is decidedly better fruit than that of the *Cereus giganteus*, but it is used in every respect for the same domestic purposes. The Papajo Indians, in transporting earthen vessels filled with syrup or preserves made of the fruit to market, cover their jars with a thick coating of mud, which renders them less liable to break in handling, and at the same time keeps the contents cool, and prevents evaporation, the crockery used being very porous. The fruit is eaten in enormous quantities, and, being very nutritious, the consumers quickly acquire an extraordinary increase of bulk. In making wine or syrup the seeds are easily separated from the pulp by the use of water. They are carefully collected, dried, parched,

and pulverised, after which process they are digestible and nutritious.

The singular species of Cactus (*Echinocactus Wizlizeni*), commonly called *boiznacha* by the Spaniards, being 20 inches, or more, in diameter, a section of the stem is often employed as a cooking vessel. The seeds are small and black; but, when parched and pulverised, make good gruel, and even bread. The pulp of the fruit is rather sour, and not much eaten. Travellers, in passing the Cactus wastes, often resort to this plant to quench their thirst, its interior containing a soft white watery substance of slightly acid taste, which is rather pleasant when chewed. It is a common sight to see on each side of the road these plants with a large perforation made by the thirsty traveller. An Indian, when travelling, and wishing to make a meal, selects a large plant, 3 or 4 feet long, and 2 feet in diameter, cuts it down, and hollows it out, so as to form a trough. Into this he throws the soft portions of the pulpy substance, which surrounds the central woody axis, and adds meat, roots, seeds, meal, fruits, or any edible thing on hand. Water is added, and the whole mixed together. Stones are then highly heated, and dropped into the mixture; and, as they cool, are taken out, licked clean, re-heated, and returned to the cooking vessel, until the mixture is thoroughly boiled. This is a favourite dish with the Yabapais and Apaches of Arizona. The Papajo Indians pare off the rind and thorns of large species of this Cactus, letting it remain several days to bleed, when the pulp is pared down to the woody axis, cut up into several pieces, and boiled in syrup of the *Cereus giganteus* or *Cereus Thurberi*. If a kind of sugar made by the Mexicans is attainable, it is employed instead of the syrup, thus forming a good preserve. These pieces, when taken out of the liquid and dried, are as good as candied Citron, which they much resemble in taste.

P. L. SIMMONDS.

PELARGONIUM QUEEN VICTORIA.

THE races of Pelargoniums which we have long possessed might be thought sufficiently numerous to embrace all the novelties likely to occur among these plants for some time to come. Such, however, is the extent of variation among seedlings that, now and then, distinct forms crop up which are themselves likely to form the centres or parents of small groups. Such is the case with the Pelargonium which we now figure. It is vigorous in habit, and blooms most profusely, its flowers being borne in dense globular trusses, well elevated above the foliage. The individual blooms are also large, and nearly circular, each petal being elegantly crisped, or frilled, a condition which gives much fulness to the flowers, most of which have six petals instead of five; and then there are three upper segments deeply blotched with blackish-maroon, instead of two, the usual number. The lower segments, as will be seen, are of a brilliant orange-scarlet or vermilion colour, which the white margin sets off to advantage; and there is a distinct white eye which still further adds to the brilliancy of its surrounding colour. As a decorative plant for the greenhouse or conservatory, it is destined to become a general favourite, especially as its semi-double flowers are more durable than those of the ordinary single kinds. This remarkable and handsome Pelargonium has been sent out and is now being distributed by Mr. Bull, at whose establishment in the King's Road, Chelsea, we have seen it beautifully in flower, together with a darker-coloured variety, named Beauty of Oxtou, another fine kind, similar in habit, and one which also bears frilled white-edged flowers.

B.

Roots in Drains.—In a paper recently read before the Edinburgh Botanical Society, some curious cases were cited of the entire occupation and stoppage of drains by roots of trees. In one instance a 2-inch pipe, with sockets, laid in an orchard a foot below the surface, was completely filled with the roots of an Apple tree. In another, a root had entered a lead pipe and grown and branched into numerous fibres which filled the pipe for a considerable distance. The strangest case was where a Willow growing near a dam had sent roots 25 feet beneath a road, and penetrated a large leaden drain-pipe 7 feet below the surface, and stopped it. The pipe was taken up and cleared, and the tree cut down. The drain was relaid, but some time afterwards was again stopped. It was then found that the stump, which had sprouted, had sent a mass of rootlets into the drain, which had filled the pipe solidly, although their connection with the tree was only by a single fibrous rootlet.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Sowing Lettuce.—Make successional sowings of Lettuce, and at this season it is a good practice to draw shallow drills 12 or 15 inches apart, and to sow the seeds in the bottom; the plants can thus be well soaked with water when they require it; advancing crops will be benefited by the application of manure-water. Early crops of the Cos varieties should, as they approach maturity, be tied up with bast, which is of much assistance, even in kinds that are the most disposed to turn in their leaves and blanch naturally, and, moreover, it improves the quality. Amateurs who have not had much experience in Lettuce growing are apt to tie the ligatures too tight, which bruises the leaves and causes them to rot. All that is required is to draw the leaves together with the hand and tie them sufficiently close to exclude light. Keep the surface between advancing crops frequently stirred with the hoe; and, where the soil is of a heavy retentive nature, and was at all wet when dug, its condition will be greatly improved by forking it over to the depth of 6 or 8 inches, care being taken not to disturb the roots of the growing crops. Ground so treated becomes pulverised by the action of sun and air, and is in a better condition for the roots to penetrate later on as the different crops advance in growth. Small Salads should be sown every ten days or, at all events, every fortnight; otherwise, the supply will be interrupted. When the weather is hot and dry let such plants, and especially Radishes, be watered, or they will be tough and stringy. A small sowing of Walcheren Cauliflower should now be made.

Planting Brussels Sprouts.—These should now be planted; and in order to obtain a full crop, the plants ought to be got in when they are large enough to handle. The weight of produce will thus be double what it would be if the plants were long confined to the seed-bed. Brussels Sprouts do not require so much room as winter Broccoli; but they must by no means be planted too closely, or they never attain the vigorous hardy condition which alone enables them to stand a severe winter. The nature and condition of the soil in which they are grown has much to do with the space they should occupy. In good well-manured land they should be put in 2 feet 3 inches apart each way; in shallow poor soil, they may be placed 6 inches closer, both in and between the rows. Move them, so far as possible, with their roots entire; and, if the weather be dry, give them a good watering.

Apricots, Peaches, and Nectarines.—Apricots are often much infested with a small caterpillar that eats the leaves, and this, if allowed to go unchecked, does serious harm, rolling itself up much in the same way as the rose maggot; it is, however, easily detected. The trees should be gone over as soon as it makes its appearance, and the invader crushed with the finger and thumb. If the fruit has not been sufficiently thinned, at once remove more, not allowing a greater quantity to remain than the trees can support and mature thoroughly, otherwise the produce will be small and comparatively flavourless. See that no trace of Aphides has been left on Peaches and Nectarines, or they will still spread, and inflict serious damage. As regards thinning, the remarks made respecting Apricots apply to these trees also. Let the strength of each individual tree be taken into consideration, such as are strong and vigorous being naturally able to support a greater weight of fruit than others in a weaker condition, although the latter generally set the greatest quantity. Over-cropping not only gives inferior produce, but permanently injures the trees, if continued for a few years, so as often to necessitate their removal. In many cases, the situation is blamed for this state of things, whereas, if they were sufficiently supplied with water, and not over-cropped, they would live and fruit up to a vigorous old age. Watch closely for mildew; if it makes its appearance on the leaves or points of the shoots it will quickly attack the fruit. As soon as a trace of it is found the affected parts must be dusted freely with sulphur; the old-fashioned sulphur-puff is the best and most simple instrument to use for this purpose. If we have a continuance of dry weather, and the border in which these trees are grown is cropped with anything else, such, for instance, as Strawberries or summer vegetables, it should not be forgotten that the latter materially assist in extracting the moisture from the soil, and necessitate the application of more water, which must be given without stint. Before it is applied in quantity the surface should be stirred with a fork or hoe to a depth of a couple of inches to admit of its getting down to the roots; in dry situations, where water has to be given, it is often necessary to repeat this loosening process, as the soil gets baked on the surface and causes the water to run off. Do not allow the leaves to overhang the fruit, which should be fully exposed to the sun; but, in this operation, do not go too far, as the extent to which the leaves of Peaches and Nectarines are often destroyed, where excessive disbudding is practised, renders it utterly impossible that the trees should possess their

wanted vigour. It is necessary to thin out the shoots, so that all allowed to remain will have a full share of air and light to strengthen and mature the young wood for next year's fruiting; but all beyond this is injurious, as every leaf removed proportionately curtails the formation and power of the roots.

Cherries and Plums on Walls.—These are also very subject to caterpillars; and, when they appear in numbers, they do much harm, not only disfiguring the leaves, but absolutely injuring the trees. There is no means of destroying them, except by going over such as are affected, and crushing them. This should always be done as soon as they are discovered, as the longer they are allowed to remain, the more difficulty there is in their destruction. Cherries are also subject at this time of the year to the attacks of black fly on the young shoots. If this pest is taken in time, before they have become dispersed over the trees, and while confined to a few of the shoots, they may be easily destroyed by dipping those that are affected in tobacco-water; for this aphid it must be strong, as it is much more difficult to kill than the green species.

Flower Garden.—Bedding plants that have been confined in small pots, with the roots much matted before they were turned out, require a considerable amount of water in dry weather, until they have had time to lay a firm hold on the soil, so as to draw the moisture they require from it, and, unless well supplied in this respect, suffer seriously. See that all are pegged down as growth progresses; otherwise they are sure to be injured by the wind. This training is necessary to ensure the beds being well furnished in the least possible time. Daisies, Aubrietias, Alyssums, or similar plants, which, on account of their being in flower at the time the principal bedding plants were put out, were not then removed, should, as they get shabby, be transferred to the reserve ground, and their place taken up by those subjects that I before advised should be kept in readiness for the purpose. Look well to such plants as Verbenas, Asters, and others that are similarly subject to the attacks of green fly; for, if it is allowed to remain upon these plants, it will, in a short time, spoil them for the season. Even when all reasonable care has been taken that they were clean when turned out, it frequently happens that they become affected afterwards, in which case there is no remedy but a thorough washing with tobacco-water, or dusting with tobacco powder.

Herbaceous Borders.—Numbers of plants will now require supporting by sticks and ties. This should always be carried out as soon as it is needed, or the plants get broken down and disfigured by the wind. To do the work in a proper manner requires some taste and consideration as to the nature of the plants. Nothing is more common than to see the sticks and matting brought so prominently into view, as to make it appear that they, and not the plants, were intended to be looked at; or to see each plant bound up as tight as a Birch broom, with an injurious effect, both as regards their health and natural appearance. Never use more supports than are absolutely necessary, and keep them as much out of sight as possible.

Pits and Frames.—As the frames are now cleared from bedding plants, the latest-sown Melons should be put in them; these will come in late in the season. The beds need not now be made so substantial as was necessary earlier in the season; if a good supply of last autumn's leaves are at hand they may be made of at least one-half of this and well-prepared dung. Three feet in depth will be enough now; beds of this description will be sooner cool enough to receive the plants than those recommended earlier in the season. In localities not favourable to the growth of Tomatoes, or where a difficulty has been experienced through attacks of the disease with which this vegetable has of recent years suffered, it would be advisable to grow some in frames. If the plants are put into 12-inch pots and plunged in the ground, and the frames elevated on bricks so as to give increased head room, good crops may be secured. The principal thing to be observed in their culture is to keep the plants sufficiently thinned and well tied out, not allowing them to suffer for want of water, and giving enough air to induce stout growth.

Flower Garden and Pleasure Grounds.

The principal operation connected with this department, viz., that of planting the various beds, borders, baskets, and vases, with their summer occupants, will now in most cases be finished; and it is, more than ever, necessary that order and neatness should be scrupulously maintained. Lawns, at this season, are often much disfigured by Daisies; and, during dry weather, when Grass does not grow very rapidly, the Daisy rake will be found useful. Plantains, and other broad-leaved weeds should now be eradicated, if possible; and this may be done by cutting their heads off with a sharp knife, just under the surface of the soil, when they may be drawn out, and the space they occupied will soon be taken possession of by the finer Grasses of which the lawn should consist. Box edging may now be cut. It is seldom advisable to do this sooner than about the present

time, as the slightest frost occurring soon after the operation has been performed, will inflict so much injury upon them as to make them look unsightly for some time afterwards. Tie up Dahlias and Hollyhocks, as they continue to require that attention. It is always advisable to place stakes to such plants as soon as they are planted, or before their roots have had time to extend themselves, as driving large stakes into the ground at a later period is apt to injure their roots. Bulbs of Hyacinths and Tulips may now be taken up and stored away. Peg down the shoots, and regulate the development of such plants as Verbenas and Petunias, in order to get the surface of the beds covered as speedily as possible, when less water will be necessary than at present. Regulate also the growth of climbing Roses, Honeysuckles, the new and beautiful Clematises, all of which are worthy of a place in every flower garden. Where stock of the various kinds of spring bedding plants was not divided or otherwise increased when taken from the beds, that may be done now, or as soon after this time as possible. Such kinds as the following may be divided, if desirable, to an almost unlimited extent, viz., *Viola cornuta* and *lutea*, *Aubrietia deltoidea*, *deltoidea variegata*, *Campbellii*, *greca*, &c.; *Myosotis dissitiflora*, *Omphalodes verna*, *Phlox verna*, *Gentianas*, *Hepaticas*, hardy *Primroses*, *Oxlips*, &c. The two last named will now be out of flower; but the best varieties should have been marked, and should now be increased accordingly. All these, together with the various double and single Wallflowers, should have what little attention they may require in the reserve garden, which is also the proper place to test, during the first season, the numerous novelties in the way of bedding plants, which are annually introduced, and which are generally sent out in the form of very small plants in May. As soon as they are received they should be re-potted, and have every necessary attention; and, where they have been well treated, such plants will now be sufficiently established to be planted out in this department, in order that they may furnish cuttings at as early a period as possible, and also afford opportunities of forming correct opinions as to their merits and adaptability to the purposes for which they are recommended. Wherever rival leaders may exist upon young trees, more particularly upon those belonging to the Coniferous family, the strongest and best placed should be selected, and all others carefully removed. An undue tendency to lateral extension is frequently exhibited by young trees of this description, and this should also be checked by stopping, or slightly cutting back all strong side-growing branches, with the view of directing the energies of the tree to the production of upward growth.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Indoor Fruit Department.

Vines.—All young Vines in pots should now be growing freely, and manure-water may be given them with advantage at every alternate watering. Red spider is the only pest which is liable to damage them after this time; but frequent and copious syringings will keep the foliage perfectly clean. Those Vines that are intended for planting out when ripe should be stopped as soon as they are 4 or 5 feet high, as the lowermost buds ripen and develop better on a cane of this length than on one a few feet longer. No benefit is to be derived from growing a great length of cane for planting, as the top, which is generally the best part of it, is ultimately cut off. Fruiting canes may be allowed to grow until they are 6 and 7 feet long before they are stopped. The growth which breaks away from the top bud after being stopped should be permitted to make a couple of joints, above what will be the principal cane. When free-growing Vines of this kind are kept closely pinched at the end, the buds further down frequently burst and grow, and this interferes with the production of good wood. Never grow any kind of young Vines too closely packed together, or in any position where they are deprived of light, or where the sun's rays cannot get at every leaf. The back wall of a lean-to unshaded house is most suitable for them in summer; a house with a great deal of fire is unnecessary. The more hardily Vines are grown, especially those for early forcing, the less difficulty will there be found in obtaining the best results. Where mildew has been troublesome, an abundance of fresh, dry, warm air, which can now be freely admitted to Vineries on suitable days, will check its further progress. To eradicate it thoroughly, damp the affected parts, and dust them with sulphur while wet, and the present is the best time for doing so.

Pines.—Where suckers on Queens and other varieties are likely to be very small, when taken off in July, all the leaves should be cut back to within 2 or 3 inches of the stock, as soon as the fruit is cut, which enables the suckers to obtain all possible benefit through the roots. This course has also the advantage of letting more light and air about the suckers, and making them more symmetrical in form than could possibly be the case when they are crowded round with leaves. Water sparingly after the leaves are cut, but do not allow the atmosphere to become too dry.—J. MUIR.

Peaches.—Early Peaches are now ripening fast under the present warm and favourable weather, and an abundance of air must be given to flavour and colour the fruit. The trees should still be syringed carefully twice a day, to keep the foliage in good health, and as a preventive of red spider; at the same time, no water from the syringe should lodge in the hollow of the fruit around the stalk, as it will cause decay, and the fruit to drop off prematurely. On no account allow the trees to suffer for want of water at the root; this should be attended to continuously until the wood is ripened, especially in light porous soils. The young wood should now be tied in to allow the fruit to be benefited by sun-light. When the space between the wires and the glass is filled up by young growth, the under foliage gets too much shaded; it also obstructs a free circulation of air over the fruit. When the latter has been gathered, the trees may be still further thinned of this year's bearing wood, to allow room for laying in the current year's shoots. Attention should be paid to the gathering of the ripening fruit; the experienced eye will readily detect such as are ready to pick.—W. D. C.

Hardy Fruit.

Apricots, Peaches, and Nectarines should now be finally thinned; were this always completed before stoning commences there would be fewer complaints of fruit dropping at the stoning period. It is the excessive demand for nourishment made on the trees by the fruit at this critical period that causes it to drop. The young growth or shoots intended for bearing next year should also be laid, tied, or nailed in, as the case may be, in doing which see that each shoot has sufficient space, that all the sunlight and air may have free access to every bud; well-ripened wood and buds are indispensable to successful fruit culture. Now that all danger from frost has passed, pinch or cut off all superfluous growth from Pears, Plums, and Cherries, and apply the usual remedies for the destruction and prevention of aphides and blight of all kinds. Cordons and espaliers of Apples and Pears should now have the fruit thinned, the shoots pinched back to three or four eyes, and the leaders tied to supports. For nearly all kinds of fruit summer pinching is preferable to winter pruning, a fact that is now in a way of being fully recognised. Strawberry runners, whether intended for forcing or planting out, should be layered as soon as the young plants are formed. For the former purpose early runners are essentially necessary, that a long season may be had for the full development and ripening of the crowns, without which it is useless to expect successful results. Blackbirds and thrushes attack the fruit as soon as, and sometimes before, they change colour, and it is advisable, therefore, to protect it with netting as soon as it begins to turn. Water effectually when necessary.—W. WILDSMITH, *Heckfield*.

Orchids.

In June, these plants will require much the same treatment as they did last month. It will be necessary to supply them regularly and plentifully with water, especially those that are well rooted. Where the Sphagnum Moss does not appear healthy, and has become sour, fresh material should be substituted. The *Cattleya Mossiæ* section, that has finished flowering, and require it, should now be potted. They do well in a mixture of rough fibrous peat, mixed with coarse silver sand and crocks. *Dendrobium Bensoniæ* and *D. Devonianum* will also require potting. These grow in equal parts of fibrous peat and Sphagnum Moss, with coarse sand and crocks. They should have a night temperature of 70°, and this should be allowed to rise as high as 90° by day with sun-heat. *D. infundibulum* does well in the temperature of a *Cattleya*-house; after potting, allow 65° at night, and this should be permitted to rise to 80° by day with sun-heat. Care should be used in watering *Lycastes* that have begun to make growth; the water should not be allowed to settle in the young shoots till the bulbous part is formed. *Phalænopsis grandiflora*, and others should be plentifully supplied with water, till they have finished their growth. They should be subjected to a temperature of 70° by night, which may rise to 85° or 90° by day with sun-heat, and should be thickly shaded from June to August. They will be much improved by having their leaves sponged frequently with water. *Dendrobiums* that are growing freely should be regularly sprinkled with water, or they will be infested with red spider and thrips, which, if allowed to increase to any extent, will injure the growth for the entire season. *Cypripediums* that are growing freely should be watered with weak liquid manure twice a week. *Odontoglossum Roezlii* and *O. vexillarium* do well in a temperature of 65° by night and 80° by day with sun-heat. Keep *Masdevallias* and *Disa grandiflora* abundantly supplied with water, and also use weak manure-water twice a week. The floor and benches of Orchid-houses should be sprinkled two or three times a day with water during the present and two following months; as the greater portion of Orchids will be making growth, this treatment will benefit them much.—E. CULLEY, *Ferniehurst*.

THE KITCHEN GARDEN.

ARRANGEMENT AND EXTENT OF THE KITCHEN GARDEN.

THE kitchen garden is an indispensable adjunct of every mansion, to which it should, to some extent, be proportionate in size; and to serve its purpose thoroughly its situation and arrangement should be well considered. This is not a needless recommendation, for grave errors are often committed in this respect. I am acquainted with several very extensive kitchen gardens, laid out within the last few years, in which neither a practical knowledge of kitchen gardening nor judgment in the selection of a site have been kept in view,—mistakes only discovered when it was too late. Sometimes a bad situation is chosen, and a good one narrowly missed. Such an instance came under my notice lately, where the 8 or 10-acred enclosure was pushed forward upon an unequal, precipitous slope, that an expensive range of hothouses might, it seemed, be hid from view behind, and one of the finest sites that could be found for a range of houses missed inside the walls of the garden, where one would naturally expect to find them, and where, if aspect, convenience, or appearance had been considered, they would have been placed. The first consideration in the selection of a site is

Soil.—In some respects this is a question subservient to that of situation, for part of the soil can be brought from the neighbouring fields, as I have known it done, rather than sacrifice a site otherwise suitable. It is found that most kitchen garden crops and fruit trees thrive in soils of widely different character. I have known a garden in which most plants flourished well, except in very dry seasons, where the soil consisted almost of pure red sand on a sandstone formation. Indeed, it was found to be so sandy at a spade's depth, that, to get a tilth of sufficient substance, most of the soil had to be carted from the fields around where the garden was made. A good sandy loam is best for general purposes, and very light or very heavy clayey soils should be avoided. Otherwise no soil is bad that yields fair pasture, provided it is deep enough; but, as a rule, it will be not only desirable, but necessary, to trench the ground over to a depth of 2½ feet, or 2 feet at least, adding to it at the same time such materials in the shape of leaf mould, manure, turf scrapings, clay, general vegetable refuse, lime, &c., as may be found needful to improve the staple, and the improving process may be continued annually by trenching and re-turning as much ground as circumstances will permit.

Situation.—In choosing a situation two important considerations are shelter and water. Shelter is of the utmost importance, for cutting winds have, if anything, a worse effect upon growing crops than spring frosts. The most injurious prevailing winds which we experience in this country are from the north, north-east, and east; the western hurricanes are more destructive by their force than otherwise. At all these points, therefore, but particularly the former, shelter should be provided, either by taking advantage of rising ground or plantations. If these do not already exist, then plantations should be made of those trees which are found to grow fastest and most luxuriantly in the district; but, in any case, sheltering objects should be far enough removed to prevent injury by their shade. Low situations, though generally affording the best means of shelter, and also the deepest and richest soil, should not always be chosen, for various good reasons. The site should be at a moderate altitude, where, if the natural soil is not so good, the sub-soil is generally drier, and the facilities for drainage much greater. The ground should be level, or slope gently to the south. Steep slopes should be avoided, even if it is necessary to make the garden at a considerable distance from the mansion; for, in addition to the extra difficulty of working such ground, the soil is very apt to be washed with heavy rains, causing much loss and inconvenience.

Water.—As regards water, the supply cannot be too close at hand, and hardly too plentiful, in a kitchen garden; at the same time proximity to a lake is far from desirable, on account of late frosts. Some notable mistakes have been made in this respect, and late and early frosts work annual havoc with vegetable crops and fruit trees; indeed, French Beans, early Potatoes, and similar plants are secured only by the most elaborate protective measures. From whatever source the water is supplied, it has, in most cases, to be distributed throughout the garden by means of pipes, and, whether for hose and hydrants, or taps, it should be readily accessible at numerous points to ensure its plentiful application when required, and save labour in carrying. When the supply comes from a natural reservoir (assuming that hose and hydrants are not available), open tanks are not so needful; but when the water is pumped, or from a bore-hole, and consequently always considerably colder than the soil,

tanks are then a necessity, and, by being always kept full, the water will generally be warm enough for all purposes.

Extent and Plan.—The extent of ground to be devoted strictly to vegetable and fruit growing must, of course, depend upon the demand. Nothing less than 1 acre will suffice for any house above the pretensions of a cottage. The number of people that this area is calculated to supply with vegetables or fruit in season is variously estimated at from twelve to eighteen, according to the climate and soil, &c. Probably fourteen is as many as could be supplied in a moderate way, and I would not put the number so high even as this where the kitchen garden is expected to produce more than an early and second early crop of Potatoes. Another consideration is the means allowed to work the garden—a question affecting the production quite as much as the extent. It is much better to utilise 1 acre thoroughly than to have 2 acres only half-cropped and ill-managed; but in estimating the area to be enclosed by walls it should also be remembered that it costs less, proportionately, to wall in 2 or 3 acres than it does 1 acre, while there is an extended wall surface for fruit trees, which is of some consequence in a cold climate; besides, if the ground is not all required for vegetable crops at times, it can be employed some other way. As to plan, the simpler it is the better. A parallelogram running east and west, that the greatest extent of wall surface and borders may have a south aspect, is the usual and most approved form. The walls should never be less than 12 feet in height. The north wall might be made considerably higher than this with advantage—perhaps 16 or 18 feet—the east and west walls descending by ramps from each corner towards the south. This would not only increase the sheltering power of the walls, but would afford more room upon them for training fruit trees, a 12-foot wall being too low for many kinds of fan-trained trees. When the area enclosed does not exceed more than 3 or 4 acres, an intersecting or middle wall is not to be recommended, as it necessitates a further sub-division of the ground and more walks, which reduces the cropping space; but, in a 6 or 8 acre garden, such a wall is an advantage for the shelter it affords from cold winds, the boundary walls under such circumstances exerting hardly any influence in the central portions of the garden, over which the blast sweeps as over an open field. Within the walls the ground need only be divided into four quarters by broad intersecting walks passing through its centre each way, and communicating with the side walks, which should run entirely round the square, having a 12 or 14 feet border between it and the walls for the fruit trees. In very large gardens the quarters may be again sub-divided by narrower walks, for convenience in distributing manure and clearing the ground of crops, &c.; but no purpose is served by departing from the square form in making the plots. It is usual to have the range of fruit and hot-houses inside the walls, which is an excellent arrangement. In old gardens these houses generally abut at once upon the vegetable quarters; but, as they generally afford a pleasant and interesting promenade now-a-days, the external surroundings may be a little more in keeping. The best arrangement I have seen in this respect was the placing of the houses on a level site at the top or north side of the garden, with a broad walk in front the whole length of the range, and between the walk and the quarters a strip of Grass with a few low shrubs in flower beds here and there, and, beyond, espalier fruit trees, as a screen to hide the rougher vegetable crops behind. It is not the place here to enter into details connected with the laying out of the ground, and I shall conclude with a few remarks on the drainage. The sub-soil in some districts is so porous, and carries off all superfluous water so readily, that draining is perfectly needless. In deep or heavy soils, resting on retentive bottoms, draining is, however, of the utmost importance; for little or no success can be expected in the culture of the majority of vegetables, and certainly nothing can be done with fruit-trees when the surplus rainfall does not pass quickly and freely away. The drains should be about 20 feet asunder, and 3 feet to 4 feet deep—deep enough, at all events, to prevent their being disturbed at any time in gardening operations, such as tree-lifting, planting, or trenching, &c.; 2-inch tiles are wide enough, unless in unusually wet districts; and the drains should have sufficient fall to the main drain, which should be calculated to carry off readily as much water as the whole series of drains are likely to pour into it at one time. C.

Root Grub.—I have lately noticed in your columns remarks relative to this insect, known as grub, and the means of protecting plants from its ravages. As my garden is greatly infested with insects I avail myself of the present opportunity to send you some grubs which give me infinite trouble and vexation, and which I imagine are the pests alluded to at page 400, in your issue of the 15th ult. As mentioned there, the plant suddenly begins to flag,

and, when pulled, comes away from the ground with ease without the root. I have used powdered lime, but with no good effect. I shall, however, try it mixed with soot. I am more particularly troubled with it in a north border, which, being under the shelter of a brick wall, is shaded from the sun, but I find that it is spreading all over the garden, and being only an amateur, I am somewhat disheartened with my want of success. In the vegetable garden, these grubs attack with great energy Strawberry plants, eating off the leaves and bloom, and my Spinach has also suffered severely from them. I should feel obliged, therefore, if you could inform me of any way of destroying them, as they seem most difficult to kill. I have placed some in a vessel containing tolerably strong soda and water, and they have been alive 36 hours afterwards; strong salt-water kills them after some hours, but this could not be used in the garden where plants are growing. I have been recommended to use chloride of lime and water, but should be glad of some information concerning such a mixture before using it. I am also much annoyed with respect to worms and centipedes eating out the hearts of my bulbous roots, and have lost my Japan Lilies through this cause.—**BETA.** [The grubs sent are what are called "leather jackets," from the toughness of their coats. They are the larvæ of the Daddy-long-legs fly (*Tipula oleracea* or *T. maculosa*), and do an infinite amount of damage in their young stage to the roots of many plants. Curtis describes the various devices he tried to get rid of them, and, among others, are those which have occurred to your correspondent, brine, soda, lime water, &c., but he ends by saying that the only remedy he has practised with success has been searching for them round sickly plants, and digging up all that have been just eaten off by them.—A. M.]

The Ravages of the Potato Beetle.—"R. E. P." writes to the "Times":—"I own, in Chester co., Pennsylvania, a small farm of about 34 acres. The mansion-house, to which 7 acres are attached, I used as a residence during the summer months, the remainder was rented to a neighbouring farmer. Last spring he planted his Potatoes in a field adjoining my vegetable garden, 2 acres of which were also planted with Potatoes. In the month of August the farmer's Potatoes were attacked by the beetle. Lime in powder was sprinkled over the plants, but to no purpose. The tubers were injured to that extent that it did not repay the trouble of taking them out of the ground. My plants escaped until September, when I perceived a few beetles on the haulm, which soon became a host, and the plants above ground were quickly destroyed. The tubers were but slightly affected, as they had almost attained their growth before the haulm was attacked. Alongside of the Potato patch a row of purple Egg plants were under cultivation; these were attacked, and both fruit and leaves were destroyed. The beetles were numberless, and could be taken up by handfuls. After this they came up into the house, and were found creeping over the verandah and into the sitting-rooms and chambers. It is not astonishing that the Mayor of St. Louis should have replied as he did to his correspondent. Prior to my experience in August last, I might have written as he has done. It is certainly a pest greatly to be dreaded, and although I perceived that some of your correspondents think that the climate of Great Britain will not agree with them, I hope that the experiment may not be tried.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Another Remedy for the Potato Disease.—Mr. William Jenkins, of the Willows, Abergavenny, writes to us stating that he has found that if a mixture of two parts of cotton-seed oil and one part of kerosene be applied to Potatoes before planting, the result will be a crop free from disease.

Fern-leaved Parsley.—We have sent you specimens of this Parsley, a kind picked up by our traveller in the United States a year or two ago. We consider it distinct and beautiful, and we intend offering it to the public next season.—JAMES CARTER, DUNNETT, & BEALE. [A remarkable variety cut into extremely fine segments.]

Snowflake Potato.—I purchased last spring 1 lb. (three tubers) of this new American Potato, and I cut them into twenty-four single eyes or sets, which were duly planted after giving time for the wounds to dry. Twenty-three are up and growing vigorously, and I am pleased with their appearance. The tubers are handsome, and the flesh white and delicate.—E. HODDAY, Ramsey Abbey.

Forcing Early Peas in Pots.—I have a quantity of early Peas in pots fit for gathering. They consist of the dwarf varieties *Multum in Parvo* and *Blue Peter*, two kinds which I can highly recommend for productiveness, and their pods are large for those of early Peas, while the Peas themselves are of excellent flavour. They have been grown in pits without much forcing, a little heat having only been put into the pipes in January and February to keep frost out. In the same pits I have tried *William the First*, but it is rather too tall for pot culture, although one of the very best early Peas grown in borders. I had my old favourite dwarf Pea, *Little Gem*, ready for gathering in the beginning of May, but I mean now to discard it in another year for growing in pots, as *Multum in Parvo* and *Blue Peter* produce larger pods and are more prolific.—WILLIAM TILLERY, Welbeck.

THE HOUSEHOLD.

COOKING SPINACH.

THIS excellent vegetable forms a good accompaniment to meat when plainly boiled in plenty of water, with all the moisture carefully pressed out of it; it should then be chopped small, put into a clean saucepan with a slice of fresh butter, and stirred until it is well mixed and very hot; it should then be placed smoothly in a dish, marked in dice, and served.

Purée of Spinach.—Boil it until quite tender, chop it, and rub it through a sieve with great care, put it into a saucepan with a small lump of butter and pepper and salt; stir this mixture well, taking care to preserve the green colour, and serve it hot. A dish of mutton or veal cutlets, or fried pieces of chicken, may be arranged like a crown on a dish with this purée in the middle, or there may be poached eggs or little rissoles placed upon the purée. Any of these form a pretty luncheon or supper dish.

Mould of Spinach.—Boil the Spinach, and, after it has been squeezed and chopped, stir it over a moderate fire until it is very dry; moisten it with as much thick rich gravy as will flavour it well, and turn it over and stew it fast until it is again dry; then press it into a hot mould of handsome form, turn it into a dish, and serve it quickly; 2 or 3 ounces of fresh butter may be used as a substitute for gravy. A perforated tin shape is the best for moulding Spinach, but one of earthenware, slightly buttered, answers perfectly well.

Spinach à la Française.—When boiled and chopped, put the Spinach into a pan with a tablespoonful of pounded sugar, a little grated nutmeg, 6 ounces of fresh butter, and a tablespoonful of flour; when this mixture has been stirred over the fire for some time remove it, and add a tablespoonful of thick cream; dish it, decorating it with fried croutons—these are small pieces of bread, cut out with a pastry cutter, and delicately fried in butter. Leaves of light pastry (baked) may be used instead.

Asparagus.

The superiority of English over French Asparagus is now pretty generally admitted. The French is very much blanched, and the stalk being consequently hard and tough, a great deal of it is wasted.* This is not the case with English Asparagus, most of which when well grown can be eaten. The variety which grows wild in some parts of the Continent, particularly in the Rhine country is good, though, of course, far inferior in size and quality to that grown in gardens. Asparagus is excellent, either as an accompaniment to meat or eaten alone, when plainly boiled in well-salted water (the addition of a bunch of Mint improves the flavour), and served on a toast, with good melted butter. French cooks add two tablespoonfuls of vinegar to the boiling water before the Asparagus is put in, in order to preserve its green colour. The time of boiling varies from ten minutes to half-an-hour, according to the age of the vegetable.

Asparagus Soup.—Take 1 quart of good beef stock, which has previously been well flavoured with Carrots, Onions, Parsley, and Thyme, add to it, a few minutes before serving, a small bundle of Asparagus (say one dozen heads), cut into pieces about 1 inch in length, and previously boiled, with a tablespoonful of purée of Spinach (made as directed in the receipt), a lump of sugar, a little Celery salt, and a very small piece of butter. A teaspoonful of chopped Parsley is considered by some people an improvement. Boil all these together for four or five minutes, taking care not to break the Asparagus. Serve the soup with fried bread in another dish.

Asparagus with salad mixture.—When boiled, throw it into a good quantity of cold water, mixed with four tablespoonfuls of vinegar. Let it become cold, and it will be green and firm. Dish it, and serve in a tureen, with a sauce prepared with salt, pepper, two tablespoonfuls of vinegar to five of olive oil. This is a favourite mode of dressing Asparagus on the Continent. French vinegar and the purest oil should always be used.

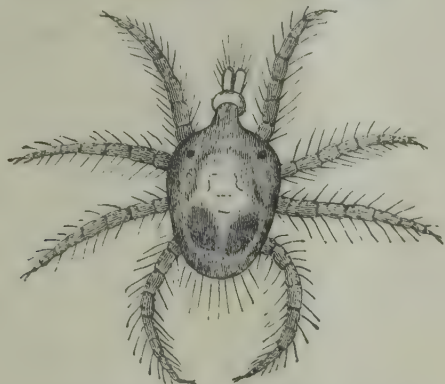
Asperges en Petits Pois.—This is a convenient mode when too small to make a good appearance plainly boiled; cut the points so far only as they are perfectly tender, in bits of equal size, the third of an inch long, boil them in well-salted water for ten minutes; if they are then tender, take them out, drain them, and spread them on a clean cloth; when dry, put them into a saucepan with a good slice of butter which has been previously dissolved, stew them gently for eight or ten minutes, dredge in a small teaspoonful of flour and nearly that quantity of pounded sugar, then pour in enough boiling water to just cover the Asparagus, and boil it rapidly until but little

* No waste need occur if the heads are all cut as nearly as possible to one length, tied in a compact bundle, and placed erect in the water, leaving about an inch of the tops out of it. In this way the tips of the shoots of even the largest Asparagus may be perfectly cooked, and the lower parts made to a large extent soft and edible.

liquid remains; stir in the beaten yolks of two eggs, heap the Asparagus high on a dish and serve very hot. The sauce should adhere to the vegetable as in green Peas à la Française. N.

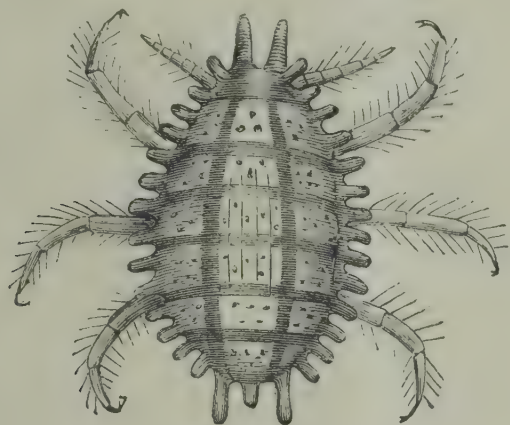
GREENHOUSE PARASITES.

MANY who possess conservatories and greenhouses are wholly unacquainted with the various kinds of injurious insects that dwell in them, more especially those which feed on the life-juices of plants. Let me therefore give a brief description of these parasites.



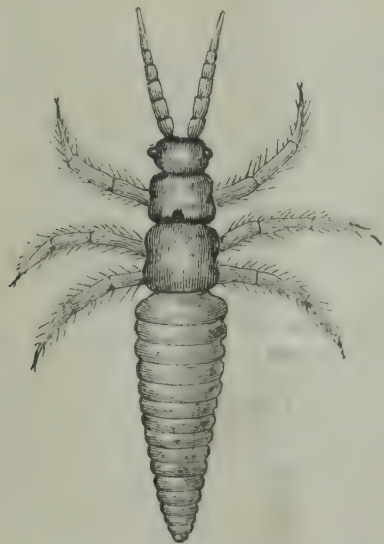
Red Spider (*Acarus tellarius*), x 30.

I shall not, however, allude to the Aphides, the most mischievous tribe of all, as with these most of us are acquainted. The next greatest pest is the Thrips adonidum, which in the summer season abounds on every outdoor flower; as, for instance, the blossom of the Bind-weed, Dandelion, Rose, &c. This insect is minute, its colour being



Mealy Bug, x 20.

generally black or rusty; the abdomen is long and pointed, and its wings are of a dirty white; the antennæ and legs are yellowish, the extremity of the former being black. The larva and pupa are of a pale yellow, and very unsightly to behold, especially when seen under the microscope. These, as well as the mature insect, are found on



Full-grown Thrips, x 25.

the underside of the leaves they prey on, having pierced which, they extract the juice, depositing it in black spots over the leaf. This being of a glutinous nature, fills the pores, and afterwards the leaf turns a pale yellow or a sickly green, and falls off. In March the full-grown insects are found collected together, and as the warm

sun of spring comes forth, they depart abroad to raise a household for themselves. Another species, called *T. ochraceus*, feeds on fruit, and does great damage to it by piercing the stalks, and causing the fruit to fall off before it is ripe. In appearance it is similar to that just mentioned, but it is more hairy. The next destroyer appears under the classical name of Coccus, or scale insect. Those generally found fixed on the stem and leaves of the plant are females. They are shield-like in shape, being convex above and flat or concave below; have six small legs; and, as the insect increases in age, these grow into their bodies. On the underside of the insect is a sucker, with which it pierces the cuticle of the plant, so as to obtain the desired food. Soon after the female lays her eggs she dies, and her body becomes covered with a long white woolly substance, that guards her eggs during their incubation. The Coccoi are of various colours, the darkest being generally the fullest-grown: the males are active, and are very small. There are many species of the same insect, known as *C. Vitis*, *C. Testudo*, *C. Hesperidum*, &c. They should be exterminated as soon as they appear, for if allowed to get ahead, there will be great difficulty in effecting this afterwards, as they increase at a prodigious rate. Another pest is the Mealy Bug. This is not unlike the common Wood-louse, but is of a reddish colour, and covered with a white mealy powder. The male is slender, shaped somewhat like



Larva of Thrips, x 25.



Upper side of Scale Insect, x 25.



Under side of ditto, x 25.

a gnat, has a pair of broad wings, and two brush-like appendages behind. The last member of the craft to which I shall allude is *Acarus tellarius*, better known as the red spider; in fact, although last named, it is not least in its power of destruction, and the difficulty of eradication; being excessively small it is not easily seen unless by keen eyes. It is generally of a bright brick-red, yellow, or brown colour; on each side of its back is a small black spot: this only is seen when magnified. Its shape is similar to the generality of the Acari tribe. It is found on the undersides of the leaves of the plants infected; while there it sucks the juices out of them, and by the web it spins from vein to vein, destroys the power of healthy inhalation of the life-giving gas; the leaves then turn pale-coloured, and fall off. This in many instances destroys the vitality of the plant. One thing is very remarkable, and that is, how Nature has provided for the safety of these insects by giving them the instinct to hide from general view, on the undersides of the leaves, telling them, as it were, "that they are thieves, and must work in the dark." There are many modes of destroying these enemies of vegetable life, says "Science-Gossip," from which these remarks are taken, the principal being fumigation, syringing, and dusting the stems and leaves with compounds of a powerful nature.

The Hardest Gum Tree.—According to experiments tried at Tours, *Eucalyptus rostrata* would appear to be the hardest species. Our Californian readers could probably add something to our knowledge in this respect, as the Gum trees have been very extensively planted in that country, and many kinds of them.

Value of the Acacia Wood.—The Locust tree (*Acacia*) is used in large quantities for the wheel-spokes of the best carriages made in France. This tree, the cultivation of which was so strongly recommended a generation ago, has been in great disfavour with growers. As the steadily rising prices of carriage-work render it more profitable, it begins to be more in favour. Its extraordinary lasting qualities when used as posts, either in earth or water, are well known.—E.

Cedrus Deodara in Ireland.—Perhaps the finest avenue of Deodars in Ireland (says the "Gardeners' Record") exists at Charleville, the seat of Viscount Monck. The specimens, which are planted on either side of a walk nearly 500 feet in length in the pleasure grounds, are very large, even in girth, and in the most perfect health. Many of them vary in character to a remarkable degree—one specimen in particular being most distinct in habit and appearance. The side branches of this particular tree shoot out more horizontally than those of its neighbours, and the tips of the side shoots droop more perpendicularly than is usually the case with this tree. As seen now, with its new, pale yellowish-green growth and graceful habit, few Conifers, if any, can match it.

TREES AND SHRUBS.

ADVANTAGES OF PLANTING IN GROUPS.

By WILLIAM GORRIE.

WERE the question merely, whether grouping or mixed planting is most productive of landscape effect, it might be conceded that the unanimous verdict would be in favour of judicious grouping—and that also on landed properties of all sizes, from the 2 or 3 acre villa, where groups are necessarily restricted to a few specimens, upwards through increasing sizes of country estates, to the most extensive and variously surfaced demesnes, where they may form masses of tens, twenties, or even hundreds of acres of the same or closely allied kinds. But were grouping only to be deemed admissible on condition of its being equally profitable with mixed or promiscuous planting, I fear that its most strenuous advocates would fail in its defence; more especially were it required that its landscape effects should be maintained unimpaired by other kinds of nurses from the time that the young trees attain to sufficient size for concealing the natural herbage of the ground surface. For, in the first place, there is the additional cost of the young plants; and, secondly, the thinnings will not yield nearly the money returns that would be derived from Larch, Firs, and other cheap and fast growing nurses. I will return to this subject after making a few remarks on the grouping of trees for landscape effect, under the following heads, viz.—1. Soil and situation. 2. Forms and sizes of groups. 3. Grouping with the same and allied kinds. 4. Grouping with different kinds. 5. Grouping with respect to size, form, and colour of leafage. 6. Park clumps, belts, groups, and solitary trees. 7. Avenues. 8. Fences.

1. Soil and Situation.—The choice of soils and situations best suited for the healthy development of the different kinds of trees is even more important in ornamental than in economic planting, and as, in the former, the number of sorts dealt with is much greater than in the latter, a more widely extended knowledge of arboricultural botany is needed than is usually aspired to by merely practical foresters. Farther, in ornamental planting, a knowledge of the wind-resisting powers of the different kinds of trees is specially needful, in order to arrange them so that the stronger may shelter the weaker, and prevent that one-sided appearance that, although prized by artists in depicting wind-beaten scenery, is looked upon by tree-admirers with feelings of unpleasantness.

2. Forms and Sizes of Groups.—Premising that in group planting the operator should have a clear perception of the appearances that all the kinds of plants operated with will present at the successive stages of their after-growth, the forms of groups should be irregular, and without hard or harsh outlines, as exemplified on a large scale by the few native forests that are still left in our country, where, from masses of the Scotch Fir on the lower flats and hill sides, flake-like portions run up irregularly into the more or less sheltered hollows and ravines, skirted and interspersed, where the soil is wet, with groups of Birch, Alder, and Willows; occasionally underwooded on drier and rocky parts by patches of the Hazel, Mountain Ash, Bird Cherry, Holly, and Juniper. It is in planting large extents of hills and mountain slopes that grouping or massing can be carried out to the fullest and most effective extent. And although this may be done successfully with the kinds of trees in ordinary cultivation, it can be far better accomplished by employing a much greater diversity of sorts; commencing near the sea-level with Chestnuts, the true Planes, Walnuts, and other natives of southern Europe, or of similar climates, associated with Poplars and Willows by the water-courses, and succeeded in ascending progression by Limes, Oaks, Cedars, Elms, Maples, Ash, Beeches, Silver Firs, Spruces, many of the true Pines, and others, the hardier of which fringe extensive masses of the more remunerative Larch and Scotch Fir, till succeeded in turn by the Cembran and Mountain Pines, Birch, upland Willows, and other representatives of the higher regions of tree life. Grouping on a large scale may also be done with good effect in low country, flat-lying plantations that are much overlooked from elevated places, as residences, public roads, railways, &c. But with such plantations it is generally more expedient to restrict the grouping to near and at their outer margins. In plantations on such an extensive scale as here indicated, the most remunerative kinds of trees should of course form the larger masses; but no group should be so small as to be ineffective, or indistinctly noticeable in the general landscape, when viewed from important, although somewhat distant, points of observation. These remarks, with reasonable modifications, are also applicable to plantations of diminishing extent, down to the villa grounds of a few acres; where the outside appearances should not be forgotten, although the views from the house windows and internal walks may be deemed of more paramount importance. But even here grouping is decidedly pre-

ferable to mixed planting. Where, however, the space to be operated upon is very limited, it is seldom advisable to plant more than one tree or shrub of the same sort, and that should generally be associated or grouped with its marked varieties or kindred species.

3. Grouping with the same and allied kinds.—By far the most generally commendable mode of group planting is that of associating species with their varieties, and others belonging to the same or allied genera. Here, however, the question of economy would come in with hindering, if not prohibitory effect, were it necessary that all the kinds should be the same or nearly the same in number. But this is by no means the case; for the kindred kinds deemed ultimately to be most remunerative may predominate so far as to produce the desired landscape effect, the others being introduced as side groups of greater or less size, proportionate to the original cost of plants, and their ultimate commercial value. All that are intended to be permanent specimens should be allowed plenty of room for their full development; and they should be arranged so that their decreasing heights will show off the taller kinds behind, and bring down the general outline to connect agreeably with the adjoining ground surface. Where allied dwarf grouping kinds will thrive as underwood, they are the most suitable to plant as such, and next to them shrubs with somewhat similar foliage; for nowhere should the under growth contrast harshly or unpleasingly with the general mass when viewed from the outside, unless when only of such low heights as to associate with the Grass and other natural ground herbage. As an example of regular and hard outline grouping to be avoided, a plantation of fully fifty years standing may be instanced on the steep rugged slopes of Kinnoull Hill, near Perth, where the different kinds were originally grouped in straight-sided, square, and parallelogram-like fashion, except where some of the outlines are broken into by the bases of the magnificent precipices which form the preponderating features of the hill. Thinning out, and the irregular spreading tops of the reserved trees, have tended in some measure to tone down the rigid straightness of outline which the groups originally presented; but they still and will remain as blots in landscape arboriculture. Another, although less objectionable example, in which the outlines are more irregular, but not less abrupt and harshly defined, is observable from the decks of Clyde steamers in passing between Roseneath and Kilcraggan—the age of the trees appearing to be between twelve and fifteen years.

4. Grouping with different kinds.—Trees widely different in their affinities, but having a resemblance to one another in the size and forms of their leaves, may be associated in groups. Mixture of kinds, however, is most commendable when they possess some other marked characteristic in common, such as colour of foliage, bark, and flourish, habit of growth, or form, &c. Thus, when depth or darkness of colour in leafage is desired, fit associates exist in the purple Beeches, Oaks, Elms, Hazel, Barberry, &c. Where light colours are wanted, they are at command in the Corstorphine Plane, the Golden Oak (*Quercus pedunculata concordia*), Golden Ash, Birch, Alder, and Elder, as well as in the gold and silver-shaded Yews, Moonlight Holly, Spruces, and smaller Coniferæ; as also among the naturally silvery-foliaged trees, such as the Abele Poplar, the Huntingdon, and some other Willows; the Whitebeam or Service tree, Sea Buckthorn, &c.; while among strictly variegated trees and shrubs there exists a wide field to select from. The autumnal colours and tints of fading foliage deserve marked attention at the hands of planters for ornamental effect. And whether the rich scarlets and purples of our native Geans and of some American Oaks, the golden-yellow of the Norway Maple, or whatever colours are wanted in plants that have been grown from seed, it is a wise precaution to select them in the nursery, when the colours are most marked, as the fading leafage of plants raised from seed is generally much varied, although these be of the same species or kind. Colour in bark is most appreciable when branches are denuded of their foliage; and small or moderately-sized groups, having distinct colours, tend to break up or relieve that dull monotony which prevails in deciduous woodland scenery throughout the winter and early spring. The following may be instanced:—With white or light coloured bark—the common and several other kinds of Birch, Constantinople Hazel, Snake-barked Maple, the Cane or white Welsh Willow (*Salix decipiens*), *Cratægus punctata*, and some other Hawthorns, &c. With yellow or orange-coloured bark—the yellow-barked small and large-leaved Limes, Golden Ash, Golden and Copper Willows, &c. And with reddish, dark, or blackish bark—the red twigged or coral Lime; *Salix acutifolia*, *S. Daphnoides*, *S. purpurea*, *S. nigra*, and some other Willows; *Cratægus M'Nabiana*, and several other Hawthorns; the red Dogwoods, &c. With regard to flourish—although the Horse Chestnut and the Gean are the only full or large-sized forest trees that produce showy blossoms, there are of smaller trees the Pavias, and other allies of the former; while, belonging to the same natural order as the latter, there are others of

the Cherry tribe, Hawthorns, Services, Mountain Ashes, Mespiluses, Almonds, and the wild form of the Apple, Pear, and Plum. In other families, there are the Scotch and English Laburnums, Robinias, Lilacs, Elders, &c., which, together with Rhododendrons, Azaleas, Weigelas, and other flowering shrubs too numerous to mention, are admirably adapted, when grouped according to their colours, for decorating the margin as well as the interior of our woodlands. And on prominent rocky snabs, natural sites for the Rowan, the Gean, and Sloe Thorn, the snowy whiteness of the last two displayed before the earliest leafage of spring, is ever the admiration of all beholders. Of distinct habited trees, drooping or weeping kinds, which only attain to little above their original height, are very serviceable for shutting out lower and near-at-hand unsightly objects, without impeding the views of more distant and important scenery. In such a case, weepers being comparatively few, a judicious mixture of kinds becomes necessary in order to obviate disagreeable monotony and uniformity. This suggests a procedure that is too generally neglected in opening up views that have become interrupted or shut out by the overgrowth of injudiciously planted trees, viz., that of grafting some of these with weepers at requisite heights, particularly Ashes and Elms, which are the most easily operated upon; and the more general adoption of this practice would be the means of retaining many a fine stem or bole, where their presence is ornamental as well as needful. Among upright, pyramidal, and conical-formed trees, we have the Lombardy Poplar as the most important, from the great height to which it attains, as well as from the remarkably fastigate upright habit of its growth, characteristics which render it highly suitable for certain localities, but most incongruous in others. Thus, when neither too thickly nor over widely grouped at the ends of a bridge, viaduct, or high-level topped embankment, those horizontal lines are, as it were, balanced and supported by the perpendicular lines of the Poplars, and the latter have a singularly important landscape effect when seen rising from among ordinary plantations over these horizontal surfaces, as well as over flat-topped ranges of buildings, while, among or rising behind groups of round-headed trees, their occasional presence has a very pleasing effect. On higher, drier, and more exposed grounds, some of the taller-growing conical-topped Conifers, such as the Silver Fir, are productive of similar results; but great care is requisite not to introduce either these or the Lombardy Poplars over abundantly. In pleasure-grounds, a lower class of fastigate trees, as well as of shrubs, may be introduced with equally effective results, such as the different upright-growing Elms, fastigate Oaks, Hawthorns, Thorn Acacia, Alders, Yews, Junipers, Cypress, &c.; but neither should they be over abundantly planted.

5. Grouping with respect to size, colour, and form of Leafage.—In planting, as in painting, light and dark colours, as well as size impart apparent nearness or distance when the trees are equally removed from the observer, and this is still more obvious when the leafage is alike or nearly so in form. For example, if a Corstorphine, a common, and a Jersey Plum or Sycamore are thus equi-distant, the light colour of the first will make it seem nearer than the second, while the darker colour of the last will make it appear as if still further off. In like manner, with the common Sycamore, the Sugar Maple, and the English Maple, the diminishing size of the trees, as well as of their foliage, would seemingly place the first in advance of the second, while the last, from its much smaller as well as darker green foliage, would appear as if considerably beyond. Again, with very dark colours, such as the Purple Beech, Purple Elm, and the like, if these are planted equi-distant with common Beech and Elm, the purple-foliaged trees would appear much further off in proportion to the depth of their colouring; and these effects are still more marked when such very dark-foliaged plants occupy situations that are shaded from the sun at the time of observation, as on the north or east sides of plantations. Deciduous trees retain the aforesaid appearance of nearness and distance according to the size of their foliage, even when it has fallen, from its being a general rule that the strength or thickness, as well as the number or quantity of the young shoots or branchlets, is proportionate to the size of the leaves. This is exemplified in our largest-leaved trees, the Horse Chestnut and Common Plane, with their few and thick shoots, contrasted with the Birch, which is at once the smallest leaved and most slenderly as well as closely twigged of ordinary forest trees. One of the seemingly most difficult problems that the landscape forester has to solve is that of making straight lines appear crooked, and stiff ones easy. This, however, is often a very necessary performance, as in the case of hedge-rows and other lines of trees, as well as in straight or stiff outlined belts and plantations. But it can be often successfully performed by attending to the preceding rules.

6. Park Belts, Clumps, Groups, and Solitary Trees.—In arboricultural decoration of most of the ornamental parks and

pleasure grounds that surround country mansions, there is too much unmeaning sameness and want of design. The outer belts, as well as the interior clumps, are usually planted with unseemly mixtures of overcrowded ordinary kinds of forest trees, rising abruptly to full height from their fence enclosures, without any attempt at rounding or sloping them down so as to associate harmoniously with the surrounding turf, by means of intervening ornamental trees of diminishing stature and shrubby underwood. Not unfrequently some convenient corner is set apart for Conifers or other fashionable novelties so near the mansion, that either it or they will have to be removed before they are half-grown. Or, if sufficiently remote from it, they are planted so close to one another, that, to prevent the whole becoming unsightly abortions, the axe will have to be freely applied for thinning ere they are half a century old. Others, it may be, are scattered about at more suitable distances; but, with such, a too common fate is injury or destruction from the drip, shade, or wind-falling of too near and much older neighbours. This last remark is not to be taken as recommending the removal of fine old park trees, that may have been favourites with their successive owners for centuries, but is, with the others, designed as an argument against planting choice young trees in such situations, when, in many instances, better accommodation might be had for grouping them in the belts and clumps before mentioned. Park belts and clumps are admirably adapted for grouping trees and underwood in the different manners before described; and detached clumps are specially suited for grouping the different families apart. Thus the Oak would form one of the largest and most perfect clump groups; comprising as that genus does not only round and spiry-headed trees of the largest sizes, but also many tall as well as dwarf evergreens, and a goodly assortment of low and intermediate-growing deciduous kinds, together with a wide diversity in the sizes of their leaves. Compare, for instance, those of the common Oak, which are by no means the smallest, with a leaf of *Quercus macrophylla*, such as that brought away by Mr. Baxter from Riccarton, which measured 17 by 7 inches. Clumps of such other families as are deficient in required characteristic particulars might have others of needful forms, colours, &c., tastefully associated with them, both as trees and underwood. Park groups of separately fenced trees should only be of select fine-growing kinds, and single trees still more particularly so; each group of the former generally consisting of allied varieties, species, or genera. And plants of Hawthorn, Briars, Sloe Thorn, Furze, &c., growing from at and near the base of some of these singly-fenced trees, produce a good effect by dispelling that sameness that their bare stems would otherwise present.

7. Avenues can scarcely be left without a passing notice when treating of group planting. They may either be straight or curved, and are generally associated with a roadway or a grassy ride; and they may either be composed of two lines, all of one kind of tree; four lines of two kinds or tribes of trees, or what may be termed the arboretum avenue, in either two or four rows of distinct sorts, grouped or brought together in families. The first, when intended to form a close gothic arch-like covering, should be planted near to one another in line, and they may be as near to the roadway on each side as half its width. The second or double avenue should generally have the rows next to the roadway or drive of one kind, and the other two rows of a different kind; but full space should be allowed for the after development of every tree, from the ground upwards, without touching one another, encroaching upon the roadway, or concealing from it the trees in the back rows. A very usual and generally commendable practice is to have two corresponding rows deciduous and the other two evergreen trees. The third, or arboretum avenue, is better in four than in two rows, where sufficient space can be devoted to them, as they admit of the dwarf kinds being kept in front and the taller ones behind. And in both the second and third kinds of avenues the back lines may be associated with groups of underwood and shrubbery where adjoined by plantations, and where concealment of or from the outside is intended. This arrangement is peculiarly suitable for the arboretum avenue, as affording scope for a collection of underwood or small trees and shrubs, as well as of the larger trees. In selecting the kinds of trees for forming the first two described avenues, it is most essential to avoid such as are capricious in their adaptation to any diversity of soils or exposures that may present themselves, so that the greatest possible uniformity of healthy growth may be secured throughout the whole length. And they should, by continuous yet almost imperceptible pinching and pruning, be kept in pleasingly symmetrical forms, so as to prevent the growth of double tops and disproportionately large side branches, that are unsightly in themselves, and become liable to wind breakage as they progress in size and age. In regard to the sites or situations of avenues, whether straight or curved, those are best where they do not cut up fine expanses of grassy greenery, or conceal distant interesting scenery—as by the outer edges of such expanses,

through or by the sides of woodlands, and outside of home parks, where approaches have to be carried through arable fields; for which last the second and third modes mentioned are specially adapted.

8. Fences.—With reference to plantation fences, it may be remarked that grouping for the purpose of breaking up stiff outlined belts and margins becomes far from effective when these are fenced by obtrusive stone dykes. When the outside of a plantation thus grouped is looked upon over an intervening knoll which conceals its fence dyke, the apparent distance or nearness that is thus imparted to its margin becomes in a great measure dispelled on advancing till the dyke become visible. Hedges, and more especially well-kept ones, are liable to similar objections, but in a less degree; and this may be still further lessened by suiting them to the trees and underwood behind, as by an entire or thickly mixed hedge of the purple-leaved Barberry, where, backed by purple Beech, Elm, Hazel, &c.; by Holly, Mahonia, evergreen Privet, &c., in front of broad-leaved evergreens; and by Whins, Junipers, &c., where backed by small-leaved evergreens, such as the Coniferae. Iron fences, except for shelter, are preferable to either of the preceding when sufficiently distant from the drip of high trees, to allow of a thick growth of underwood between. But a fence preferable to either, especially for ornamental park groups, clumps, and belts, can be cheaply formed where stones are abundant, by arranging those in irregular rockery-like outline, say 15 to 18 inches high in front, backed alternately by larger ones in four, six, or even more circumjacent informal layers or lines, with small spaces between, and only a little rise in the ground surface, where requisite, to supply soil for the free growth of thorny plants, such as the wild and double Scotch Roses, in front; Sweet and other Wild Briars, as well as a mixture of the more robust growing garden Roses, Furze, Barberry, Junipers, &c., next; then Hawthorns, Hollies, Sloe Thorn, and Sea Buckthorn, the last in dry, bare places, where the others will not grow; the whole being thickened by an undergrowth of Mahonias, Brambles, Ayrshire Roses, Honeysuckles, Ivy, and other rambling creepers, allowed to grow in natural wildness. This would form an impenetrable, as well as a highly picturesque barrier, against the inroads of both man and beast, besides being one of the best for game covers; and the interior might be fitly occupied by spineless underwood and shrubs, interspersed with strong free-growing herbaceous plants, a race far too much neglected in ornamental forestry. The well-known aversion that cattle and sheep have to passing over rough stony surfaces, even when by no means thickly interspersed with thorny vegetation, argues well in favour of this wild-fence notion; and, if fairly tried, it will doubtless be found cheap and effectual, as well as ornamental. As with ordinary hedges it would, of course, require temporary outside fencing.

Nurses.—As regards these, wherever the landscape effects of group planting are intended to be early and continuous, the nurses employed for sheltering the young permanent plants should be either the same or of the faster-growing kinds that assimilate with them in general appearance, for the obvious reasons, that they give the required shelter soonest, and they are the most remunerative as thinnings. For example, the Larch, as a nurse for the Larch; the Scotch Fir for itself and other true Pines; the common Sycamore for its own kind, as well as for others of the Acer family; the Turkey Oak for others of its genus; and the Ash, in addition to sheltering its own relations, will make a passable nurse for the Walnut and others having similarly divided leaves. As a nurse for the Silver Fir and the darker coloured Spruces, the Balm of Gilead or Balsam Fir is especially suitable, from its dying out generally at from 25 to 30 years of age, and thus obviating the tendency that too often exists among woodmen to spare trees after their presence becomes hurtful to their neighbours. When the early effects of group planting are not deemed paramount, the Larch will prove a profitable nurse, in situations not calculated for its long-enduring healthy existence. In order to get the greatest number and value of thinnings from a given space, pruning, by shortening or cutting in the side branches of the nurses, so as to prevent them interfering injuriously with the reserves and with one another, as well as for stimulating their upright growth, is a treatment deserving of notice, which was recommended so far back as 1825 by W. Billington, superintendent of planting in the Forest of Dean; and in 1841 by the late Gavin Cree, of Biggar, whose somewhat different mode has since been very successfully practised on the estate of Sir John M. Nasmyth, in Peeblesshire, as well as on that of the Earl of Stair, in Midlothian, and elsewhere.

Applying some of the preceding remarks to near-at-hand examples of avenue treatment, you will, on visiting Sir Walter Scott's monument, and the renowned Edinburgh Meadows, have opportunities of estimating the arboricultural taste and skill of our city rulers. At the former, you will see avenue trees selected with the utmost disregard to their adaptation for the soil and situation; the kind

being the common or Wych Elm—one of the most capricious of ordinary forest trees—each with a stem of a few feet, surmounted by a besom-like head of numerous contending branches, as if (should they ever attain to sufficient sizes) for the easy ascent and comfortable accommodation of city roughs when viewing passing processions. At the latter, where, according to R. Maxwell, of Arkland, Mr. Hope, of Rankeillor, commencing about 1722, "raised beautiful hedges and trees, made rich meadows and pleasant walks, where gentlemen and ladies resorted;" and which, in "Campbell's Journey through North Britain," 1810, are described as "a Mall lamentably unlike St. James's, being shamefully neglected avenues, where there was no longer pleasure in wandering among broken-down hedge-rows and blasted trees;" a description highly applicable to their management up to the present time, as you will see by their general appearance, and especially by that of the murderously mutilated, ill grown, distorted, unsightly avenue of trees which cuts in two the lengthy expanse of grassy meadow, and regarding which so much has of late been said and written.—"Transactions of the Scottish Arboricultural Society."

SOCIETIES AND EXHIBITIONS.

CRYSTAL PALACE EXHIBITION.

MAY 29TH.

THIS was, on the whole, an interesting exhibition, pot Roses, stove and greenhouse plants, Azaleas, Heaths, and new and rare plants being well represented. Orchids were also shown in excellent condition, and there were some fine collections of plants staged for effect, as well as small Palms, Ferns, and other graceful plants in pots, suitable for dinner-table decoration.

Stove and Greenhouse Plants.—Of these, excellent specimens came from Messrs. Jackson, of Kingston, who had *Boronia pinnata*, well flowered; *Dracophyllum gracile*, 4 feet in diameter, and a mass of snowy blossoms; *Azalea petuniæflora*, 4 or 5 feet in height, and well bloomed; the yellow-flowered deep green-leaved *Erica depressa*; *Clerodendron Balfouri*, in excellent condition; *Hedera fuchsoides*; *Phenocoma proliferum*, and the soft rosy-flowered *Pimelea Hendersoni*. These varied from 3 to 5 feet in diameter, and were all well grown and flowered. Mr. B. S. Williams had good plants of *Allamanda grandiflora*, *Erica tricolor Wilsoni*, *Clerodendron Balfouri*, and a noble plant of *Hedera tulipiferum*, profusely bloomed, and fully 5 feet in diameter. In the same group were excellent specimens of the scarlet-spathed *Anthurium*, and *Bougainvillea glabra*—the last a striking plant, when in good condition, as this was. In the amateur's class, Mr. Ward, gardener to F. Wilkins, Esq., of Leyton, had well-grown specimens of the *Anthurium Scherzerianum*, *Erica Cavendishii*, *Dracophyllum gracile*, *Ixoraamboynensis*, and *Hedera tulipiferum*, also a well-flowered *Aphelexis macrantha purpurea*, and one or two other plants. From Mr. Chapman and Mr. Peed likewise came good collections of well managed plants. Among those from Mr. Chapman were *Ixora Prince of Orange*, a fine kind, bearing great trusses of orange blossoms, the foliage being as good as that of *coccinea*. *Aphelexis macrantha rosea*, well flowered. Mr. Peed had two well-grown *Francisceas*, namely, *F. calycina* and *F. confertiflora*, both profusely bloomed, and a well-furnished plant of the crimson and white-flowered *Clerodendron Balfouri*. The same group also contained *Eriostemon scabrum* and *E. buxifolium*, and a fine plant of the orange-yellow *Azalea sinensis*. Conspicuous amongst foliage plants, which were well represented, were some magnificent *Dracænas* staged by Mr. Wills. They consisted of *D. Weismanni*, a slender-habited plant, with bronzy-crimson-margined leaves; *D. Baptiste*, with broad bronze-green and brown foliage; *D. Mooreana*, well known as one of the best of all dark-leaved kinds; *D. Sheppardi*, a plant of robust habit, the bright green oblong leaves of which are irregularly streaked or margined with orange-red; also *D. amabilis*, *D. regina*, *D. excelsa*, *D. Youngi*, and the bronzy-black-leaved dense-growing *D. Dennisoniana*. Mr. Williams, of Holloway, and Mr. H. Ley, of Croydon, had also well-grown and interesting groups of new or rare foliage plants. In the first-named collection we noticed *Dracæna Fraseri*, a robust dark purple-leaved form with crimson-margined foliage; *D. amabilis*, *Ficus Parcelli*, a fine plant, 5 feet in height, and bearing small hairy fruit; *Croton majesticum*, and the bright golden variegated *C. Weismanni*; also excellent plants of the crimson-flowered *Dipladenia Brearleyana*, *Aralia Veitchi*, *Kentia Mooreana*, and the delicate fresh green-leaved *Adiantum gracillimum*. From Mr. Ley came a small but well-grown group, in which were a robust, pectinate, fresh green *Zamia Lindenii*, *Gymnogramma decomposita*, an elegantly cut gold Fern, *Martinezia erosa*, and a very distinct and effective pinnate-leaved Palm named *Calamus Puyano*, a kind with an elegant drooping habit and stout petioles, formidably armed with stout brownish spines arranged in interrupted whorls. Mr. Legge, Mr. Chapman, and Mr. Child, also furnished effective groups of foliage plants.

Azaleas and Cape Heaths.—These were both fairly represented, the plants of which the different collections consisted being mostly the same as those described in our last number. The principal prizes for Azaleas were won by Mr. A. Ratty, gardener to R. Thornton, Esq., The Hoo, Sydenham, who had remarkably well-flowered plants.

Roses in Pots.—These were fairly represented, the principal exhibitors being Messrs. Paul and Sons, of Cheshunt, and Mr. C. Turner,

of Slough. In the amateur's class Mr. Ellis staged unusually well-grown pot Roses, which were deservedly much admired both by judges and visitors. Messrs. Paul furnished well-bloomed plants of Celine Forestier, Edward Morren, a fine full rosy variety; Paul Verdier, deep rosy-purple; Madame Willermoz, white; Madame Victor Verdier, rich velvety-crimson; Charles Lawson, deep rich rose; Madame Margottin, pale sulphur; Camille Bernardin, rich deep crimson; and Alfred Colomb, rosy-crimson. Mr. Turner had La France, a charming Rose of a delicate peach colour; Miss Ingram, a distinct blush-white variety, and very fragrant; Madame Margottin, Celine Forestier, Charles Lawson, and Juno, all well-known and deservedly favourite Roses. In the class for twenty specimens Mr. Turner contributed a well-bloomed group, the most remarkable plants in which were Celine Forestier, Anna Alexieff, and Madame St. Joseph. Mr. Ellis furnished six superbly-flowered specimens of John Hopper, Souvenir d'un Ami, General Jacqueminot, La France, Celine Forestier, and Victor Verdier. Mr. J. Moorman was a very good second with somewhat smaller plants, including an excellent example of the new white Hybrid Perpetual Madame Lacharme, bearing eleven blooms, Beauty of Waltham, Madame Willermoz, and Anna Alexieff.

Orchids.—Of these, Mr. B. S. Williams and Messrs. Jackson both had beautiful groups, and Messrs. Child, Ward, and Budd represented the amateur growers. Mr. Williams had good specimens of *Cattleya Mossiae* superba, *Odontoglossum citrosimum* roseum, with three fine spikes; *Dendrobium crystallinum*, *D. densiflorum*, and well-bloomed plants of *Anguloa Clowesii*, *Laelia purpurata*, and *Odontoglossum Pescatorei*. Messrs. Jackson contributed good plants of *Vanda suavis*, *Cattleya Mossiae*, and *C. Mendellii*, all very effective, *Dendrobium Parishii*, *D. macrophyllum*, and the always welcome *Odontoglossum citrosimum*. Mr. Morse, of Epsom, had well-bloomed plants of the snow-white Lady's-slipper (*C. niveum*), *C. caudatum*, *C. Loweii*, and the now seldom seen *Camarotis purpurea*. In the amateur's class, Mr. Ward had *Pescatorei's* *Odontoglossum* well bloomed; a superb specimen of the glossy brown-flowered shaggy Lady's-slipper, *Phalanopsis grandiflora*, in fine condition; the golden-flowered *Oncidium ampliatum*; and the *Odontoglossum vexillarium*, bearing seventeen rosy flowers, described in our last week's report. Mr. Child staged *Trichopilia coccinea*, *Aërides Fieldingii*, *Vanda suavis*, and an attractive plant of *Dendrobium Farmeri*. Mr. Budd, Heatherfield, Sydenham Hill, had *Phalanopsis grandiflora*, *Oncidium phymatochilum*, and a good plant of *Oncidium ampliatum majus*.

Table Plants.—Among these were some fine specimens, many of which had the surface of the soil covered with *Selaginella* and small Ferns. Mr. T. Lambert, gardener to H. W. Segeleke, Esq., Herne Hill, had elegant little specimens of *Cocos Weddelliana*, *Dracaena gracilis*, *Adiantum cuneatum*, *Thrinax elegans* (one of the prettiest of all the fan-leaved Palms), *Calamus palimbanicus*, and the yellow-striped *Hyophorbe Verschaffeltii*. Mr. Wills and Mr. Hudson, Champion Hill, were equal second, and Mr. G. Wheeler had a very well grown collection. Mr. Wills had *Terminalia elegans*, *Croton Weismanni*, a good plant for the purpose, as its netted leaves shine like burnished gold under artificial light; and *Aralia Veitchii*. In Mr. Hudson's group we noted a good *Pandanus Veitchii*, which looks well under gaslight, the elegantly-cut green-leaved *Jacaranda mimosæfolia*, *Croton Johannis*, and *Euterpe edulis*—the last, when young, one of the most attractive of small Palms. Mr. B. S. Williams furnished an effective little group; in which were *Pandanus Veitchii*, *Aralia Veitchii*, and the still more elegant *A. leptophylla*, *Cocos Weddelliana*, *Dracaena Baptistii*, and *Kentia Fosteriana*, an elegant Palm.

Miscellaneous Subjects.—Messrs. Jackman, of Woking, sent a well-grown group of new and beautiful Clematises in pots; among which the following were remarkable, viz., *J. P. Gassioti*, a large six to eight-petalled flower, nearly white suffused with soft lilac; *Mrs. Hope*, a delicate lilac; *Fair Rosamond*, white shaded with lilac; and *The Queen*, a fine six-sepalled flower of a delicate lilac-purple colour. Mr. Wills staged an attractive collection of new and rare decorative plants, consisting of Ferns, Palms, Dracaenas, and *Cephalotus follicularis*. Mr. B. S. Williams had also an effective group, in which there were new and rare Ferns, Palms, Orchids, Cycads, and other decorative plants. Mr. John Laing, Forest Hill, contributed a well-arranged group of stove and greenhouse decorative plants, and some fine-foiled bronze and zonal Pelargoniums, which were much admired. Messrs. Jackson showed a group of the white-flowered *Saxifraga nepalensis*, which had been grown in the open air, and merely sheltered from rain when the flowers were about to open. Messrs. Carter & Co., of Holborn, staged a well-grown group of their new pyramidal *Mignonette*, and a fine basket of *Coleus Duchess of Edinburgh*, one of the most beautiful kinds ever introduced to our gardens. A good collection of hardy herbaceous plants came from Mr. Parker, of Tooting, and Mr. Ware, of Tottenham, had some excellent blooms of Pansies, as did also Mr. Hooper. Mr. R. Collier, gardener to R. H. Bristowe, Esq., Wavertree, near Sydenham, furnished half-a-dozen pans of *Selaginellas*, among which were *S. hortensis*, *S. rubicaulis*, *S. umbrosa*, *S. Mertensi* and its variegated variety. Some highly-coloured and compact-habited herbaceous *Calceolarias* came from Messrs. Dobson & Sons, of Isleworth; and Mr. Waters, gardener to A. Mongredien, Esq., also sent a well-grown group of these popular summer decorative plants. Mr. James showed six splendidly grown fancy Pelargoniums, the finest in the exhibition; and a variegated-leaved fancy Pelargonium, named *Alice*, came from Mr. Smith, nurseryman, Isleworth. Its leaves are pale green, distinctly margined with creamy-white, its flowers being white, with a bright rosy-lilac blotch. A group of seedling show and fancy Pelargoniums, all of excellent quality, came from Mr. Foster.

ROYAL HORTICULTURAL SOCIETY.

JUNE 22.

GREAT SUMMER SHOW.

CONSIDERING the financial difficulties with which the Society is beset, and the reluctance with which prizes already won have been paid, this was a much better exhibition, of both fruits and flowers, than might have been expected. New plants, indeed, were unusually numerous and striking, and, as in these the principal interest seemed to be centred, we will begin our report with them.

First-class Certificates were awarded, on this occasion, to the following:

Clematis Lord Nevill (Cripps).—This is a vigorous-growing variety, with large pale green foliage, and crisped eight-sepalled flowers, each 5 inches in diameter. The colour is a rich velvety-blue, each segment having a purplish bar down its centre. It is one of the most distinct and promising of the new kinds.

Polystichum lepidocaulon (Williams).—This a distinct and effective Fern, sometimes called *P. Hookeri*. In habit it reminds one of a *Cyrtomium*, the simple rhomboidal pinnæ being of a bright glossy green, and the rachis curiously prolonged into a caudal proliferous appendage.

Oncidium curtum (Bull).—A free-flowering and beautiful Orchid, with ovoid two-leaved bulbs and an erect branched spike of brown spotted flowers, the lip of which is of a rich golden-yellow margined with brown spots, the calli being rich purple. In shape the flowers remind one of those of the well-known *O. sarcodes*, but the plant is quite distinct from that kind.

The following received Second-class Certificates:

Pelargonium Prince of Wales (Bull).—A robust-habited semi-double variety, with bright rosy-scarlet flowers of a velvety texture, having a whitish eye. It has a dense habit, and looks as if it would prove a useful free-flowering kind for decorative purposes.

Lilium Hansoni (Wilson).—This is a beautiful Japan Lily, fully 4 feet in height, having bright green leaves in whorls, and bearing seven or eight bright orange-yellow brown-spotted flowers in a terminal spike. It appears to be nearly related to *L. maculatum* or *L. avenaceum* of the "Botanical Magazine," and is, in every respect, a first-class Lily, and one which is likely to become a general favourite.

Clematis Lady Alice Nevill (Cripps).—A distinct and effective variety, robust in habit, the foliage being of a bright glossy green. It has eight-sepalled flowers, which are about 6 inches in diameter, of good form, and freely produced, the colour being of a delicate lilac or mauve-purple.

New Plants.—Mr. Bull deservedly obtained the premier award for the best group of twelve new plants, conspicuous among which were *Croton majesticum*, remarkably well coloured; *Aralia Veitchii*, nearly 5 feet high, and well furnished to the base; *Kentia Mooreana*, from 4 to 5 feet high, its gracefully-arched foliage being of a deep glossy green; *Anthurium crystallinum*, with velvety green leaves, veined with silver; *Dracaena Hendersonii*, with bright green foliage, splashed and striped with rosy-lilac and creamy-yellow; *Phyllotanium Lindeni*, a broad-leaved Arad, 4 feet in diameter, its hastate leaves being deep green, boldly veined, and netted with ivory-white; *Croton imperiale*, a glossy, blunt-leaved, and distinct habited plant, well furnished with green leaves, margined with golden-yellow, the mid-rib being of a bright rosy hue; *Dracaena Goldiana*, a distinct and effective plant, with oblong or cordate deep green leaves, banded with zebra-like stripes of silvery-grey; *Pritchardia grandis*, a deep glossy green, dense habited, fan-leaved Palm, as rare and valuable as it is effective and distinct; *Dracaena Baptistii*; *Pleocnemia Leuzeana*, a distinct and delicately-cut Fern; and *Croton spirale*, a bronzy-green-leaved species, each leaf twisted like a corkscrew. Mr. W. Bull also staged *Odontoglossum Roezlii album*, a new Orchid, to which the first prize was awarded. In the class of six new plants the same exhibitor also obtained the first prize. In this exhibition we noticed *Blandfordia princeps*, a distinct grassy-leaved plant, with erect spikes of bright orange-yellow flowers; *Croton picturatum*, an elegant drooping plant, with yellow-spotted bright green foliage, hastate at the base; *Pritchardia grandis*, *Dracaena Goldiana*, *Lomaria dobroydensis*, and the white-margined *Dracaena canescens*. For a single new plant in flower Mr. Bull was likewise first with the new *Blandfordia princeps*, in admirable condition. Mr. Bull, in the class of six new Crotons, showed beautiful plants of *C. spirale*, *C. majesticum*, *C. undulatum*, finely coloured; *C. volutum*, each leaf curled like a ram's horn; *C. Weismanni*, and *C. Youngei*. These plants, to which a first prize was awarded, varied in height from 2 to 3 feet, and were about the same in diameter. Amongst other rare plants, Mr. Bull showed examples of *Anthurium Scherzerianum album*; *Pilocereus senilis*, a scarce Cactaceous plant, usually called the Old Man Cactus, covered with long white hair; and several new Palms.

New Plants sent out since 1872.—For the prizes offered by Mr. Bull, under this head, several competed. Messrs. Thynne, of Glasgow, were first with excellent examples of *Dracaena Shepherdii*, *D. Fraserii*, *Croton majesticum*, *Macrozamia plumosa*, *M. spiralis eburnea*, *Encephalartos villosus ampliatum*, and others. Mr. Wimsett was second with a well-grown group, in which we noted the finest *Maranta Makoyana* we have ever seen, a good plant of *D. Fraserii*, and an excellent *Dæmonorops palimbanicus*. In the amateur's class, Mr. Croucher was first with well-grown specimens of *Dieffenbachia nobilis*, 5 feet in height; *Dæmonorops palimbanicus*, a splendid specimen, 12 or 14 feet in height; *D. metallica*; *Kentia canterburyana*; and the elegant pinnate-

leaved *Guilielma utilis*, one of the most useful of new Palms. Mr. C. Legge was second. In the class for growers who have not previously won any of Mr. Bull's prizes, Mr. C. Legge was first with a well-grown group, in which were a well-flowered specimen of the bright rosy-crimson *Dipladenia Brearleyana*, *Dracæna Baptistii*, *D. Shepherdii*, *Dieffenbachia nobilis*, *Croton majesticum*, and others. Mr. Coomber, gardener, Fitzroy Park, Highgate, was second; and Mr. E. Pilgrim third. A similar prize set apart for nurserymen who have not previously taken prizes offered by Mr. Bull, was awarded to Mr. Wright, Lee, Kent, for a really excellent group of plants, among which were *Maranta Makoyana*, *Dæmonorops palimbanicus*, *Croton majesticum*, and others.

Stove and Greenhouse Plants.—Mr. Kemp, Albury Park, Guildford, showed a well-arranged group of half-specimen plants, the best among which were *Aphelexis macrantha purpurea*, 2 feet through; *Hedera tulipiferum*; well-bloomed plants of *Acrophyllum venosum*; *Boronia serrulata*, 2 feet in diameter; *Clerodendron Balfouri*, *Dracophyllum gracile*, and *Erica Cavendishiana*. Four splendid specimens of *Dicksonia antarctica* came from Mr. Wills; their trunks, which were 8 or 10 feet in height, were just throwing up magnificent crowns of fresh green fronds. Half-a-dozen large specimen *Azaleas* came from Mr. Ratty, The Hoo, Sydenham, who had *Burlingtoniana*, a fine bright semi-double rosy variety; *Iveryana*, white; *Criterion*, pale rose, margined with white, and delicately spotted; *Extrani*, bright rose; and others. In the nurserymen's class for eight plants, Messrs. Ivery, of Dorking, were first with well-flowered plants, among which were *Flag of Truce*, one of the best double white kinds; *Chelsoni*, scarlet; *Forget-me-not*, silvery rose; *Charles Encke*; *Tricolor*, white, striped with pale scarlet; and *Oracle*, a distinct small round-petalled flower, of a bright rosy-lilac colour, and very effective. Messrs. Ivery had also a well-flowered group of smaller plants. In the class for twenty fine foliage plants, Mr. Bull was first with well-grown plants, artistically grouped for effect. Among these, the most striking were *Pandanus Veitchii*, *Croton Veitchii*, *Aralia Veitchii*, a superb specimen; *Dracæna lentiginosa*, with purplish foliage and a habit similar to *D. australis*; *D. Goldiana*, *D. regina*, *D. ferrea variegata*, brilliantly coloured; *Croton Weismanni*, 4 feet in height and well coloured; *Geonoma Seemanni*, and *Paullinia thalictrofolia*, a shield-shaped plant, fully a yard across. In the same group were also fine plants of *Dion edule*, with soft glaucous pectinate leaves; *Phormium Colensii variegatum*, *Cycas imperialis*, with delicate light green frond-like leaves; *Dæmonorops cinnamomeus*, *Cocos nucifera*, *Cycas revoluta*, and the novel-looking *Bowenia spectabilis*. Mr. Wills showed a fine collection in the same class, in which there were, besides many others, *Cicca disticha*, a bright green-leaved plant, with pinnate foliage, and a habit similar to that of a *Sumach*. *Xylophylla latifolia*, with fresh green pinnate leaves, the margins of which were fringed with tiny flowers; *Aralia fastigiata*, with distinct Ivy-green drooping leaves; *Aralia pulchra*, with long-stalked umbrella-shaped clusters of radiating glossy leaflets; *Cocos Weddelliana*, *Cycas revoluta*, *Curculigo recurvata variegata*, and others. Of Palms, good collections came from Mr. Wimssett and Mr. Bull. The former had *Cocos Weddelliana*, *Geonoma Verschaffeltii* (a fine decorative Palm, with irregular cut foliage, the young growth being tinted with purplish-brown), good plants of the graceful *Thrinax elegans* and *T. elegantissima*, *Latania rubra*, *Areca lutescens*, and *Calamus palimbanicus*. In Mr. Bull's group were the rare *Acanthorrhiza Warszewiczii*, a distinct habited Palm, of *Licuala*-like growth, the upper surface of its radiate foliage being of a bright and glossy green, and the under surface silvery or glaucous. In the same group were handsome specimens of *Verschaffeltia splendida*, *V. melanochætes*, *Oncosperma Van Houtteana*, *Thrinax nobilis*, and others. In the class of six decorative Palms Mr. Wills was first with large specimens of *Latania borbonica*, *Chamaerops humilis*, *Hyophorbe Verschaffeltii*, *Seaforthia elegans*, and others. Of *Dracenas* Mr. Bull had a beautiful collection, in which were good specimens of *D. Baptistii*, the foliage of which is regularly spiral; the rare and distinct *D. Goldiana*, fully 2 feet in height, the zebra-like markings of grey on a dark greenish ground being very bright and effective; also fine plants of the robust-habited *D. Fraseri*, *D. regina*, *D. Mooreana*, *D. Weismanni*, *D. Rex*, *D. Shepherdii*, *D. amabilis*, *D. magnifica*, and the slender bronzy-leaved *D. triumphans*. Mr. Wills furnished a good group, for which a second prize was awarded. Mr. Douglas, Loxford Hall, staged two effective collections of Orchids, among which we remarked the rich lilac-tinted *Masdevallia Harryana*, two plants of the crimson or blood-coloured variety named *M. Whitbourniana*; two strong plants of the North American *Cypripedium spectabile*, on one of which were four large and rich rosy-lipped flowers; the chaste *Dendrobium Bensoniæ*, represented by two well-flowered plants; and there was also a robust *Cattleya Warnerii*, with five or six strong spikes of lilac-sepalled purple-lipped flowers. Associated with these were also good examples of *Dendrobium thyrsiflorum*, *D. Farmeri*, a well-flowered *Oncidium ampliatus majus*, and a strong plant of the singular long-tailed *Oncidium phymatochilum* bearing a branched spike fully 4 feet in length. Cycads were shown by Mr. Croucher and Mr. Bull.

Miscellaneous Subjects.—From Mr. W. Bull came six small potfuls of well-bloomed Lilies. Mr. Parker had, among hardy plants, fine examples of crimson, rose, and rosy-scarlet varieties of *Pæonia officinalis*; the snowy-white-flowered *Iberis corifolia*; *Cypripedium spectabile*, *Lupinus polyphyllus magnificus*, with five spikes of bluish-purple flowers; a good plant of the elegant *Thalictrum rubrum*, and some *Pyrethrums*. Mr. Dean, of Ealing, contributed *Campanula garganica*; the lovely blue *Lithospermum prostratum*; *Scilla Peruviana alba*; *Viola Mulberry*, a free-flowering bedding variety of a maroon-purple colour; *Aquilegia chrysantha*; and others. Mr. Dean had, also, cut spikes of the giant white *Brompton Stocks*, which were very fine, and

deliciously fragrant. Messrs. Ivery and Parker had fine collections of Hardy Ferns. Mr. B. S. Williams furnished a well-arranged group of flowering and foliage plants, to which a silver medal was awarded. A gold medal was awarded to Mr. Wills for a fine bank, of about 100 feet in length, consisting of Palms, Orchids, Ferns, *Dracenas*, and flowering plants, the whole margined with *Creeping Jenny*, which imparted quite a novel and pleasing effect to the arrangement. Messrs. Veitch & Son staged an effective group of *Ixias* and *Sparaxis*, *Iris*, and other bulbous plants, the colours being rich and distinct. Mr. Bull sent a new velvety-scarlet *Pelargonium*, with a pale-coloured eye; to which a second-class certificate was awarded, and the same exhibitor also showed two plants of his new *Pelargonium Beauty of Oxtou*. Messrs. Kelway & Sons, Langport, contributed two fine stands of *Pyrethrum* flowers, as did also Mr. Parker, who had, moreover, a beautiful collection of cut blooms of German *Irises*. Messrs. Cripps & Son, Tunbridge Wells, showed some striking new *Clematises* in excellent condition, conspicuous among which were *Maid of Kent*, a sturdy habited plant with deep green leaves, and satiny-lilac or mauve-tinted flowers 6 inches in diameter, well borne up on stout stalks; *Duke of Edinburgh*, a vigorous plant with rich violet-purple six-sepalled flowers; and *Blue Perfection*, a free-flowering pale bluish-lilac variety of good form, the sepals being flat and neatly rounded. The same exhibitors also showed a new *Cratægus* named *C. filicifolia*, a kind with tender green-lobed foliage, elegantly fringed, and *Quercus striata*, a Japanese variegated variety, with coarsely-serrated lance-shaped deep green foliage, banded with paler green. Messrs. Barron, Elvaston Nurseries, Borrowash, had *Cupressus Lawsoniana elegantissima*, a beautiful golden form of the *Lawson Cypress*; also *Retinospora tetragona aurea*, and a miscellaneous collection of Conifers, among which were *Abies Sieboldi nana*, *Chamaecyparis sphaeroidea aurea*, and *Picea (Abies) concolor*, a kind intermediate, apparently, between *P. nobilis glauca* and *P. Parsonii*; it is an effective glaucous-leaved American species, discovered by M. Röezl. G. F. Wilson, Esq., of Heatherbank, Weybridge, sent *Lilium Hansonii*, a variety with bright green whorled leaves and a terminal spike of bright orange-yellow flowers spotted with dark brown; it seems nearly related to *L. avenaceum*, and, like that species, the style is slightly declinate. A second-class certificate was awarded to it. Mr. Thomson, Clovenfords, sent a splendid cut spike of *Vanda suavis*, bearing nineteen fully-expanded flowers, which are said to remain four or five months in perfection. Messrs. Veitch staged their new hybrid *Cypripedium selligerum*.

Fruit and Vegetables.—For Muscat of Alexandria Grapes Mr. W. Bones, gardener to D. McIntosh, Esq., Havering Park, was first for medium-sized well-coloured clusters. Mr. Douglas, of Loxford, also showed some well-finished bunches in the same class, likewise three well-coloured bunches of Buckland Sweetwater, for which a first prize was awarded. Mr. T. Bannerman was first in the open class with Foster's Seedling which was good for the season, and Mr. Douglas was second with Canon Hall Muscat, the berries of which were large and fine. Mr. Earley obtained the first award for Red Frontignans. Mr. A. Grant, gardener to J. B. Glegg, Esq., Withington Hall, Cheshire, was awarded a first prize in the open class for a fine Sugar-loaf Pine, Mr. F. Miles being second with a good Queen; the last-named exhibitor also had the best two Smooth Cayennes shown, and a good fruit of the same variety came from Mr. Harris, gardener to Mr. J. H. Vivian, Singleton, Swansea. To Mr. Douglas was awarded a first prize for Black Hamburg Grapes, and Mr. Brush, gardener to Lady Hume Campbell, who was second, also had finely-ripened bunches of the same variety. Mr. Gilbert, of Burghley, obtained a first prize for Melons with Read's Hybrid Scarlet-flesh, and Colston Bassett Hybrid in the class for green-flesh. Mr. Stevens, gardener to J. B. Elliott, Esq., was second in both classes with Oulton Park, green-flesh, and Malvern Hall, scarlet-flesh. Mr. Miles was first both for Peaches and Nectarines, with good dishes of Stirling Castle and Elrue. The same exhibitor was also awarded a first prize for black and white Cherries, the kinds being Black Circassian and Elton; and he also obtained a first prize for Figs with Brown Ischia. Mr. Pottle, gardener to Sir R. Wallace, Sudbourne Hall, Derby, was second with White Marseilles. Mr. Douglas received a first prize for twenty-five Strawberries, the variety being British Queen, and Mr. Douglas was also first with President. Mr. Miles staged a fine basket of Chillies and a box of large Tomatoes, for which an extra prize was given. In the class of six dishes of Peas shown for Messrs. Sutton's prizes, Mr. Pragnell was first with William the First, First Crop Blue, Sutton's Emerald Gem, Sutton's Ringleader, McLean's Little Gem, and Sutton's Bijou. Mr. Brown was second with Blue Peter, Prizetaker, Early Premium Gem, Little Gem, and White Gem. For the four best sorts of Melons and four sets of Cucumbers, shown for prizes also offered by Messrs. Sutton, Mr. Read, The Gardens, Arley Hall, Northwich, was first, with Melons—Golden Perfection, Hero of Bath (Sutton), Read's Hybrid, and Sutton's Royal Horticultural Prize; Cucumbers—Duke of Connaught (Sutton), Marquis of Lorne (Sutton), Tender and True (Veitch), and Telegraph (Rollisson). For the prize offered by Messrs. Carter & Co. for Peas, Mr. Pragnell was again first, with Carter's First Crop, Maclean's Blue Peter, Extra Early, Premium Gem, William the First, Carter's White Gem, and Laxton's Unique. Mr. Gardiner, Lower Ealington Park, Stratford-on-Avon, sent a dish of Grosse Mignonne Peaches; Mr. Booth, Osmaston Manor, furnished several Melons; Messrs. Carter sent samples of their new Fern-leaved garnishing Parsley—alluded to in another column. A new Plum, called Improved Orleans, came from Watt's, Devizes, and is said to be well adapted for pot-culture; Mr. Batters, gardener at Chilworth Manor, sent a very fine smooth-leaved Cayenne Pine-apple.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

A BEAUTIFUL ROCK-GARDEN.

A REPRODUCTION of some of the grandest forms of Nature on a greatly reduced scale, without losing their breadth or character, is the secret of the successful creation of artificial rock-work. In mountains the scale is generally so gigantic that actual reproduction would be impossible. What should, therefore, be aimed at is to copy, on a small scale, the great features of the original, as a miniature painter would represent on 4 square inches of sheet ivory one of the vast gallery pictures of Rubens. Attempts are sometimes made in rock gardening to turn to account the natural rocks which may occur on the spot ready to the hand of the landscape gardener; but rocks thus presenting themselves are not always easy to deal with in this way. Their surfaces, in all probability, present too small a number of fissures and irregularities for the reception of the plants with which it is sought to clothe them, and very large bare places will be the result. In an Alpine valley the scale is so enormous that vast spaces of naked rock form a picturesque contrast to the intermediate spaces luxuriantly clothed with many forms of Alpine vegetation. But within the limits of a rock-garden, on even a very extensive scale, there is little room for great spaces which must necessarily remain useless as regards the purpose in view—that is, the formation of an area suitable for the growth of a rich collection of Alpine plants. Rocks that crop up in a garden, when left to themselves and only planted with a few Ferns and Brambles, or scattered with the seeds of Wallflowers and wild Pink, can scarcely be overrated as picturesque and valuable adjuncts to the wilder portions of open ground in shrubberies. When it is sought to make them the nucleus of a rocky Alpine garden, perfect success is not often achieved, and with good taste, horticultural knowledge, and a natural sense of the picturesque, better results may often be obtained by purely artificial means. I have been led to these remarks by the present appearance of the finest mass of purely artificial rock-work that it has ever been my good fortune to meet with. I might, indeed, have spoken in the plural, and said masses, for the noble composition of rocky scenery I am alluding to contains several distinct chasms or valleys, above which rise great angular pinnacles, grouped in a natural and effective manner; while, in the deepest parts, small sheets of water occur, in which some of the boldest portions of the work are reflected with charming effect. All this is, however, quite secondary to the exquisite clothing of Alpine vegetation with which these masses of rock are by skilful management so abundantly and luxuriantly clothed. I say skilfully, with due appreciation of the value of the word, because much more than merely persistent and plodding care has been exercised in the production of such a result. The faces of the different portions of rock have been made to present themselves to every variety of aspect, so that each plant may enjoy the amount and duration of sunlight that its constitution requires. There are sheltered and cave-like nooks for modest and delicate plants that under a scorching sun would perish. Near the water, great depths of peat soil or rich loam are provided for moisture-loving plants of various kinds, each being provided with its exact requirements; while, in parching weather, artificial showers from invisible fountains gently moisten the more exposed portions of the work like a gentle rain. But, as I have said, these picturesque and at the same time skilful preparations for a rocky Alpine garden become quite secondary to the garden itself when the brilliant masses of Alpine flowers, now in their greatest luxuriance, meet the eye. The great variety of these choice gems of the vegetable kingdom, which have been here brought together and made to flourish as luxuriantly as in their native regions, is so extensive and so interesting that their home is not long dwelt upon after the first glance. Its perfectly natural appearance is perhaps one of the chief causes of this. We find ourselves in a beautiful rocky valley, filled with the

loveliest Alpine flowers which at once arrest and rivet the attention. The lovely mountain *Myosotises*, the flowers large and beautiful, and softly blue, luxuriate in the crevices of these rocks; and, flowering, as they do, close down among their foliage, which clings to the stone, they resemble large jewels formed of masses of turquoises. There is another closely allied plant, also in flower at the present moment, which nearly eclipses this mountain *Forget-me-not*. It is the lovely *Eritrichium nanum*. Its flowers very closely resemble those of the *Forget-me-not*, being of the same soft blue colour, though perhaps slightly deeper in tone, the flower being almost identical in other respects. The chief peculiarity distinguishable at a glance is the exceeding smallness of the foliage, the leaves being so narrow and close-growing that they form a tuft, like a clump of Moss, upon which the flowers are thickly set, and are crowded so closely together as nearly to conceal the foliage. Conspicuous objects, too, are the abundantly-flowered clumps of mountain Pinks, especially *Dianthus glacialis*, the flowers of which are as large as a shilling, of bright metallic rose colour delicately marked, and so abundant that on their short foot-stalks, not 2 inches high, they form a crowd of flowers, literally two deep, over the whole plant, each flower half covering the other. *Dianthus neglectus* is an equally compact and free bloomer, and, by its greater depth of colour, forms a charming contrast to *glacialis*. *D. alpinus* is another species of a similar character, quite distinct in both leaf and flower from any other. A score of other beautiful species of this genus, of a more or less Alpine character, are now in full bloom on this rockery. A patch nearly a yard across, of a beautiful azure *Pentstemon (humilis)* is formed by a mass of exquisite little plants scarcely 3 inches high, of most attractive aspect. The face of the rock in some places is quite golden with the bright yellow of the dwarf Alpine Wallflower, growing almost as closely to the rocks as a Lichen. On the face of other stones of this picturesque pile the *Pinguicula* raises its erect stem from the solid rock itself with apparently no other root-hold than the pores of the stone. In lower and moister places, several species of *Trollius* flourish, especially a new and double variety of brilliant orange-chrome colour. There are two large clumps of the rare English Orchid, *Cypripedium Calceolus*, in one of which I counted thirty blooms, and the plants were growing so vigorously, that many of them had two and three flowers on a stem. The fine Siberian *Cypripedium*, crimson-flowered, and perfectly hardy, was flowering in another nook. Several other kinds of terrestrial Orchids form fine patches of rich purple at various points, some of them being extremely rare. Tufts of rock *Cistus* of many colours are everywhere covered with showers of bloom—some white, some orange, whilst others are yellow and brilliant rose colour. Nearly all the mountain Poppies—yellow, orange, and white—too, are now in their glory. Large masses of *Lithospermum prostratum* appear in conspicuous places, and the intense metallic blue of the flowers is almost too dazzling to look upon. But it is useless to attempt an enumeration of the Alpine plants now in bloom here, almost every genus of that class of plants being represented in this magnificent collection; one or two more, however, I must mention:—The beautiful *Edraianthus*, bearing a *Campanula*-like flower, but with delicately-slender glaucous foliage, almost thread-like in form, represents a genus which will form a valuable addition to the list of rock plants. The bell-flowers are of a peculiarly graceful form—there are three species in bloom here, one a dark purple, and the other two of distinct shades of soft lavender. Another extremely attractive and very neat-growing little plant is *Æthionema coridifolium*, closely related to the *Iberis* family, but more beautiful than any of them. Another attraction to me was the very pretty dwarf *Ramondia pyrenaica*, and lastly the interesting little dwarf Lily, *Lilium kamschatcense*, scarcely 3 inches high, the flower being of an intensely dark ruddy-brown, with large brilliant yellow anthers glistening in the depths of the bells like sparks of fire. It is needless to add that an immense variety of graceful hardy Ferns, many of which I had not seen before, add a feathery grace to the rocks of this miniature Alpine region. It is, without doubt, the most beautiful and extensive rock Alpine garden planned. It is the unaided creation of Mr. James Backhouse, and

is the result of eighteen years of skilful planning and incessant working, and the story of its development is quite an "art romance." The carriage of the great masses of rock from considerable distances; the invention of rough but effective machinery for lifting them finally into their respective positions; the break down of the lifting machine just as one of the heaviest stones was nearly raised to the apex of one of the compartments, and was suddenly hurled "in horrid ruin and confusion down;" and the overcoming of a thousand other difficulties, would form a very interesting chapter in the annals of horticulture.

H. N. H.

York, June 9.

Garden Sticks and Labels.—About thirty years ago, labels, cut out of sheet zinc in triangular and rectangular forms, were sold by a Mr. Thompson, of Fenchurch Street, London (both name and address, I believe, I give correctly), together with a fluid for writing on them, the ingredients of which were given to the public a few years later in one of the horticultural periodicals of the day, and are the same as those given at p. 397 of THE GARDEN. Of late years, Mr. Yeats, of Mortlake, has improved upon these labels, both in the variety of their form and in the brilliancy of the fluid which he supplies with them. I cannot but think it a great benefit to the grower to be able to put on his labels any name he pleases, an advantage those of Mr. Yeats possess in common with Messrs. Maw's terra-cotta labels mentioned in my former communication, and with the wooden labels of Messrs. Blackith, of Cox and Hammond's Quay, Lower Thames Street, whom, for want of knowing his useful productions, I was then unable to mention. He provides both labels and garden sticks; the former in the two forms required for pots and patches of flowers, and for attaching to trees; the latter of all heights, from one foot and upwards, for plants that require support. Although both sticks and labels can be easily made out of stout laths, selecting the straightest for the sticks, I doubt if many persons could be found who would not prefer getting them ready made from Messrs. Blackith at the very moderate price at which they are offered. The sticks will be found especially useful, and well worth their price. I have lately ascertained that the modern zinc label, now sold by seedsmen and others, originated with Mr. Yeats, and was introduced by him sixteen years ago; to his neatly furnished plant markers I was unable to make anything more than a passing allusion when I last wrote on this subject. It is only right that he who originates should have, not only the full credit of invention, but also the largest share of public favour.—B. S.

Haricot Chocolat.—Now, when the different ways of forcing French Beans, and the different varieties suited for that purpose are attracting much attention, it may be well to mention that the above named variety has proved the most productive for forcing in the neighbourhood of Paris, according to the last "Journal of the Central Society of Horticulture of France." We hope Mr. Gilbert, Mr. Temple, and others of our good forcing gardeners, will try it.

Thorn Trees Leafless for a Year.—Last summer, being exceptionally hot and dry, a number of red and white Thorns, planted in clumps in the Park here, did not put forth leaves, and were apparently dead. This year, however, they are all bursting into leaf, and are none the worse for a season's rest. The same thing sometimes happens with Apple and Pear trees, therefore, as long as the wood continues fresh, such trees should not be destroyed.—J. GROOM, *Henham Hall, Suffolk.*

Horse-radish Poisonous to Cattle.—An instance of cows being made violently ill, and one killed, from eating a few roots of Horse-radish thrown out of a garden is given in the "Rural New Yorker" for May 15th.

Fruits that Thrive in Nova Scotia.—Mr. C. E. Brown, of Yarmouth, N.S., after many trials, says the following Apples, out of all the varieties of the Crabs, are the only sorts that can, so far, be recommended for the coast lines and the cold regions of the province, namely, Duchess of Oldenburgh, Gravenstein, Green Sweet, Hubbardston Nonesuch, Keswick Codlin, Primrose, and Wagener.

The Judas Tree (Cercis Siliquastrum).—This and its white variety, as well as *C. canadensis*, are now amongst the most effective of flowering shrubs in lighting up our shrubberies. Bushes of these studded with rich masses of their lovely Pea-shaped blossoms are most attractive, and it is surprising how seldom they are met with in shrubberies, where their distinct inflorescence is remarkably effective. These deciduous trees grow freely and compactly, forming famous bushes in sheltered places, and I do not see, therefore, why it is so sparsely distributed.—G. WESTLAND.

Bertolonias.—Of these M. Van Houtte has raised three charming hybrid varieties, all plants with short erect stems, bearing large opposite ribbed leaves, beautifully striped and spotted. B. Van Houttei has large leaves, possessing a rich velvety ground colour, traversed lengthwise by distinct bars of beautiful magenta, and dotted all over with hundreds of spots of the same colour. B. Mirandæi is similar to the foregoing, only the leaves are not marked with bars, but are uniformly dotted with crowds of magenta spots on a dark olive-velvet surface. B. Marchandii has dark velvety leaves, striped with silver bars. These Bertolonias are remarkable for the brilliancy of their markings, which are strikingly beautiful.—M.

Stealing Alpine Plants from the Royal Botanic Gardens, Edinburgh.—A man named Murray, residing at Durie, Fife, was charged the other day with stealing fifty Alpine plants from the Botanic Gardens, Edinburgh. Accused pleaded guilty, was fined £5, with the alternative of fifty days' imprisonment, and ordered to procure £10 caution or suffer other fifteen days' imprisonment. The fine was paid, and the caution found.

NOTES OF THE WEEK.

— GREYIA SUTHERLANDI is now in flower in the great temperate-house at Kew. It has been much spoken of recently, but is not likely to become popular as an ornamental plant.

— STRAWBERRIES are ripe a fortnight earlier than usual, contrary to what might have been expected. Those in the London markets come mostly from Devonshire and Kent, and are, as yet, poor in flavour.

— THE thick stately stems of *Lilium giganteum* are singularly effective at this season, even long before their flowers open. In Professor Owen's garden, in Richmond Park, this Lily is again preparing to flower strongly. It seems to thrive as well as ordinary hardy Lilies among American shrubs in peat soil.

— WE have received Part I. of the "Transactions of the Massachusetts Horticultural Society," for 1875. It is, as usual, remarkable for the value of its purely horticultural matter. The society keeps to its own subjects, and does not discuss matters of merely botanical and fungological interest, and this seems to us a merit.

— OUR fruit-growing readers will find interesting matter in the paper by Mr. Hovey, of Boston, which we publish this week. It is particularly valuable in giving us the first account we remember to have seen of the best American-raised Pears. These are well worthy of a trial in Europe, already enriched by various American varieties of great value, such as Bloodgood, Seckel, and Clapp's Favourite.

— It may interest fruit-growers to know that the competition for Messrs. Veitch's fruit prizes is fixed to take place on the 21st of next month, in the Royal Horticultural Society's garden at South Kensington. The prizes are twenty-four in number, and vary from £1 to £15. They are offered for collections of fruit, and for Grapes, Pine-apples, Peaches, and Nectarines. The competition is limited to British gardeners.

— It will be seen, by an advertisement in another column, that entries for the forthcoming exhibition in the Lower Grounds, Aston Park, will close next Thursday. The profits of the exhibition are to be devoted to the building fund of the Midland Institute, where 2,000 students (chiefly artisans) are educated annually; £30,000 are required to be raised in order to extend class-rooms, &c., so as to accommodate a larger number than that just named. Of this sum £22,000 has already been subscribed.

— WARM and sunny as the weather now is Mr. Meston is busily engaged in planting Box, Hollies, Aucubas, Conifers, Phillyreas, and various other evergreens. They are prepared by well watering the balls two days before, the plants are taken up in the evening, transported very early on the following morning, the planting being effected as early as possible. Wet litter is put round the roots to prevent the destruction of the young roots by the dry air—good watering and a little shading in the case of valuable specimens, follow as a matter of course.

— THE current number of the "Botanical Magazine" contains coloured plates of the following new or rare plants:—*Kniphofia Macowani*, a dwarf form of *Tritoma* from the Cape, growing about 18 inches in height, and bearing spikes of bright orange-red flowers; *Crocus Crewei*, a pretty little Greek bulb, with small creamy-white flowers, the outer segments being yellowish behind, and streaked with purple; *Dracæna Smithii*, a rather tall-growing, green-leaved African species, bearing dense branched spikes of yellow flowers; *Balbisia verticillata*, a Chilian or Peruvian geraniaceous plant of slender habit, having whorled leaves and conspicuous bright yellow Poppy-like flowers; *Masdevallia Estradæ*, an elegant little Orchid from New Granada, having bright green spatulate leaves, and solitary white purple-blotched flowers with yellow tails, borne singly on slender scapes, 4 or 5 inches in height; *Viburnum Sandankwa*, a not particularly showy Japanese shrub, with oblong serrate leaves, and terminal clusters of whitish flowers suffused with pale rose.

— AT the Centennial International Exhibition, to be opened in Philadelphia on the 10th of next May, and closed on the 10th of the following November, every facility will be afforded for a full and complete display of fruits, as well as of models in wax and plaster of such as are perishable. Of small fruits, there will be certain classes, as Strawberries from the South, ready for exhibition on the opening day; and the variety and quantity of fruits of all kinds will be presented in an increasing scale as the season advances; but the most important display will, as a matter of course, be made during the months of September and October. Fruits of similar character will be classed together, in order that a more satisfactory conclusion may be arrived at as to the respective merits of like productions from different soils and States; thus, all Grapes, from whatever source, will be placed in one position; the same with Apples, Pears, and the entire list of cultivated and wild fruits and nuts. In this way creditable evidence of the resources of each State, in respect to fruit culture, will be furnished.

THE INDOOR GARDEN.

DICTYOGRAMMA JAPONICA VARIEGATA.

THIS, one of the rarest and best of all warm greenhouse Ferns, has been introduced to our gardens from Japan by Mr. B. S. Williams, of Holloway. With *Dictyogramma*, or, as it is more frequently called, *Gymnogramma japonica*, we have been acquainted for some years, but the plant of which the accompanying is an illustration, is a variegated variety, and quite new; its distinctive character consists in the fronds being prettily marked on both sides of the mid-rib by a series of pale green blotches, which form a striking contrast with the deep green ground colour. On young plants the fronds are from 12 to 18 inches high, furnished with one or two pairs of linear-lanceolate serrulate pinnæ, and a longer terminal one, as in *Pteris cretica*, with which, however, this has no affinity. As the plants get older and more vigorous these pinnæ divide, so that the fronds become bipinnate, the pinnules being of similar form to the pinnæ, but rather smaller, and the pinnæ and pinnules being always few in number. The venation is reticulated in the costal half of the pinnæ or pinnules, while the veinlets of the outer half running out to the margin are straight and parallel. The sori are naked, produced in transverse lines corresponding with the lines of the venation. This is decidedly one of the most effective new Ferns of the year, and it is one which is by no means difficult to cultivate. B.

PELARGONIUMS.

THERE are a great many ways of propagating these. The Cape varieties may be propagated by means of roots, as may also some of the fancy kinds. Another plan is to propagate by means of buds. In that case, a vigorous shoot is split down the centre; every bud has about half-an-inch of the stem left below it, from which roots will proceed. These will grow if placed in shallow pans filled with loam and sand, and set in heat. Pelargoniums are, however, readily propagated by means of cuttings taken off from the middle of May to the beginning of September. These may be struck in the open ground without any trouble except that of watering them once, as soon as the cuttings are planted, in order to settle them firmly in the soil. They require no shading, and will be well rooted in about six weeks from the time they were inserted, and can be either taken up and potted, or left until August or September, when they must be potted off for the winter in rather poor soil, which will check growth, and cause them to go to rest for the winter. In potting, use plenty of crocks for drainage, as too much water in winter will cause many of the plants to rot. Plants propagated in this way are much stronger and better than those raised under glass. Hundreds of cuttings can be taken from Pelargoniums during the summer months; they should be about 4 inches long, and firm at the base. Let each have a heel if possible, which should be smoothed off with a sharp knife; cut off three or four of the bottom leaves, and put in the cuttings at once, before they dry, in any fully exposed ground that is available—a border facing the west being perhaps best. They may be put in in rows 6 inches

apart, and 4 inches from cutting to cutting. I have seen flower beds in which Pelargonium cuttings, pricked in all round, had a very beautiful appearance in August and September. Every cutting will grow and flower abundantly, and such small-flowering plants have a very pretty effect. If the weather happens to be very dry, a little water may be given for the first few days, and after that they may be left alone until rooted, which will happen soon enough to enable you to pot them off by the end of September, and have a good stock for bedding next summer, or for pot-culture. If these young plants are not allowed to bloom during the time they were making their roots, most of them will bloom during the winter in a moderately heated greenhouse. In taking up bedding Pelargoniums, remember that every old plant is worth a dozen young ones. Old plants with stems of stout well-ripened wood, make excellent specimens that bloom early; in fact, Pelargoniums improve with age, if thinned and properly treated. The Pelargonium does not require a very rich soil—manure, indeed,

does it little good, though some few dwarf-growing sorts require a richer soil than others to bring the blooms to perfection, and in the culture of large specimen plants, manure-water is of much value. For ordinary culture, however, there is nothing like well-rotted sods, or sound loam with a slight admixture of sand. A good compost can be made of sods from an old pasture, which should be piled up in a heap and exposed to the atmosphere, and it should be chopped and turned every three months, until it is about twelve months old. At the last turning, or just previous to its being used for potting, a little sharp sand should be intermixed with it. The process of potting specimens that have flowered must be conducted with care, and should be accomplished when the young shoots have made an inch or so of growth. Then turn out the ball and shake away as much soil as possible from the roots. The roots should then be pruned just sufficiently to enable them to be accommodated in pots two sizes smaller than those in which they flowered. In these pot them firmly, water them well, place them in a cold pit, and keep them close for a week at least; then give air gradually, and at last expose them freely, but



Dictyogramma japonica variegata.

not to heavy rains or frosts. The successive pottings must be regulated by the state of the plants. Those potted at the end of July should be finally shifted at the end of October, and should be allowed to push for bloom during the winter in order to make a brilliant spring display; but the later sorts, potted in July and August, should be shifted on till November, and be put into blooming pots about the end of January, or not till February or March if they bloom late, or prove backward in growth. The main point to be aimed at is, to have plants to bloom in succession, and these several pottings will always effect this. In order to keep the plants in health and vigour, give them room in the house; let there be a free circulation of air, summer and winter, and an average temperature of 45° during the latter season, with a rise to 50° or 55° during sunshine, or when a brisk fire is made up to drive away damp and secure a thorough change of air. I would recommend amateurs to turn their attention a little more to the uses of Zonal and nosegay Pelargoniums for greenhouse decoration; the

value of these plants is not so well known as it ought to be, many having but little conception of the beautiful shades of colour that exist among them. These plants are extremely useful for winter decoration, and possess great powers of continuous blooming. In fact, no other class of plant will bloom so long at one time without appearing shabby, and no other plants can be cultivated with so little trouble. Only a small greenhouse is needed, and no great expenditure in the way of fuel is necessary; they merely want protection from frost, with good soil, water, and plenty of light. There will be no trouble with greenfly, red spider, thrips, or scale. The best varieties are Ferdinand de Lesseps, Ianthe, Jean Sisley, H. M. Stanley, Cremorne, Florence Fraser, Harry Burley, Zenobia, Payne's Perpetual, Tyersall Rival, Rose of Allandale, Sir Charles Napier, Madame Hoste, Marginatum, Alice Spencer, Lucy, Bella, Mrs. Lowe, Mrs. F. Fytche, Matilda and Master Christine, Lord Macaulay, Jessica, La Vivandière, Corsair, Lady Belper, Mrs. Musters, Nelson, Richard Cœur de Lion, Wellington, Mr. Gladstone, Polly, and King. A great many more varieties could be added, but they would not improve the list, which includes those I have grown, and can safely recommend.

HENRY TAYLOR.

AURICULAS, OLD AND NEW.

THERE is one thing remarkable about Auriculas, and that is, that the old sorts grown nearly fifty years ago are still the best flowers, with but few exceptions. On comparing a list of the premier flowers exhibited this year at Manchester with another given in an old horticultural journal for the year 1834, I find that the best flowers of that year are to be found high in the list referred to. Taking green-edged flowers first, Colonel Taylor (Leigh) and Freedom (Booth) had the highest marks in 1834, and they are still the best green-edged flowers; indeed, Colonel Taylor had the premier prize as the best green edge, the other day, in the show at Manchester. Grey-edged flowers have been much improved since 1834; none of the old flowers approach George Lightbody (Headly) or Richard Headly (Lightbody), two grand flowers which are now becoming common; and Alexander Meiklejohn, a new grey-edge, apparently a seedling between Conqueror of Europe and George Lightbody, is also a magnificent flower, and one which took the premier prize at Manchester as the best flower in the show. Privateer (Grimes), Ringleader (Kenyon), Complete (Sykes), &c., are still shown in the prize collections, and they held the highest positions in 1834. In that year the flower that obtained the highest number of marks in the white-edged class was Glory (Taylor), and this is still one of the best. Pillar of Beauty (Hughes) was the second-best white-edge. In selfs there has been much improvement; still the self that took the premier position at the National Auricula Show, Othello (Netherwood), was a popular flower in 1834. The highest on the list in that year was Flora's Flag (Grimes), the second-best being Metropolitan (Redmain). Now, on looking over the lists of other florists' flowers, such as Pinks, Carnations, Pelargoniums, or Dahlias—the Dahlia, by the way, was at the height of its popularity in that year—I find that not one of the flowers are now in the lists. It is not to be supposed that these old Auriculas are more easily to be obtained than the new sorts; in fact, they are more difficult, and not to be bought in the country. The following is a list of the best varieties, new and old:

GREEN-EDGED.

Admiral Napier (Campbell).
Apollo (Beeston).
Duke of Wellington (Dickson).
Freedom (Booth).
Champion (Page), very rare.
General Neil (Traill).
Alderman Wisbey (Headly).
Lady Richardson (Gairns).
Lycurgus (Smith).
Prince of Greens (Traill), new and rare.
Prince of Wales (Ashton).
Colonel Taylor (Leigh).

GREY-EDGED.

Colonel Champneys (Turner).
Conqueror of Europe (Waterhouse).
General Bolivar (Smith).
George Lightbody (Headly).
Alexander Meiklejohn (Kay).
George Levick (Walker).
Miss Giddings (Read).
Ne Plus Ultra (Fletcher).
Richard Headly (Lightbody).
Ringleader (Kenyon).
Robert Traill (Lightbody).
Lancashire Hero (Lancashire).
Alderman C. Brown (Headly).
Unique (Dickson).
Unique (Maclean).
Mary Ann (Fletcher).
Maria (Chapman).

WHITE-EDGED.

Catharina (Summerscales).
Glory (Taylor).
Smiling Beauty (Heap).
Favourite (Taylor).
John Waterson (Cunningham).
Model (Gairns).
Ne Plus Ultra (Smith).
True Briton (Hepworth).
Countess of Wilton (Chatham).
Omega (Turner).
Arabella (Headly).
Bright Venus (Lee).

SELFS.

Blackbird (Spalding).
Crown Prince (Turner).
Charles J. Perry (Turner).
Eliza (Sims).
Formosa (Smith).
Othello (Netherwood).
Lord Clyde (Lightbody).
Master Hole (Turner).
Mrs. Smith (Smith).
Mrs. Sturrock (Martin).
Vulcan (Sims).
Petronella (Headly).
Pizarro (Campbell).
Metropolitan (Spalding).
Topsy (Kay).
Lord Lorne (Campbell).

This list contains nearly all the best flowers that have been

exhibited this year. I finished potting this year on the 18th of May. The drainage becomes choked, and the rich surface-dressing applied in February becomes sour, and it is as well, therefore, to turn the plants out of the pots, and to re-pot as soon as possible after the blooming time is over. The compost used is not rich: a fourth-part of rotted manure, and a sufficient quantity of leaf mould and sand is added to the turfy loam to keep it open. Thorough drainage is essential. I find that if any of the plants become waterlogged they soon show it. Ventilation is the point next in importance; give all the air possible at all times, from now until October; remove the lights from the frames night and day, except when it rains. A gentle shower will do no harm to the green-leaved sorts, but it splashes the meal on the foliage of those that have white leaves. Propagation is slow work in the case of some of the varieties; others increase rapidly. When in Scotland last year, Mr. Meiklejohn, one of the largest growers, showed me a plant of Alexander (Stretch) that had not thrown an offset for six years; it had a long stem, and showed buds where the leaves had decayed. Now, in a case of this kind cut the head off, and pot it in a small pot in some light material; do not water it for twenty-four hours. Place a bell-glass over it closely for a few days at first, afterwards tilt the glass a little, and with care this top will soon throw out roots, while the old stump will also speedily show signs of life, and many cuttings will be obtained from it. As to cleanliness, green-fly is a serious pest, and must not be allowed on any of the plants. Remove it with a small brush, or by fumigating. J. DOUGLAS, in "Florist."

A PLUMOSE CYCAD.

(MACROZAMIA PLUMOSA.)

THIS is one of the most graceful of all Cycadaceous plants for general decorative purposes, its green feathery leafage possessing all the freshness and beauty that belong to the most elegant of Ferns, combined with the permanence and stately aspect of some of our Palms. This fine Cycad grows well in a moderately warm greenhouse or conservatory, where, intermixed with other plants, it will prove to be of the utmost service. It has been recently imported from Queensland by Mr. William Bull, to whom we are indebted for the illustration of it which appears on p. 483. From a small ovate stem, the scales of which are woolly, rise the erect spirally-twisted leaves, which are from 2 to 2½ feet long, and have a flattened petiole. These leaves are furnished nearly to the base with narrow linear leaflets, which are set at intervals of about a quarter of an inch, and are from 6 to 8 inches long. The plant is remarkable for its distinct and elegant character. It has been awarded a first-class certificate by the Royal Horticultural Society.

GLAZED POTS THE BEST.

THE green slimy coating which so very quickly forms on the outsides of pots, in moist warm stoves especially, has long been felt to be an unsightly nuisance in well-ordered gardens. It entails much unproductive labour in plant culture. This is more especially the case where soft, river, or lake water is used, and this is the best kind of water for plants. The amount of rubbing and scrubbing required to keep pots clean is very great, for no one with an eye to order and cleanliness can long tolerate pots coated with slimy green. To prevent this troublesome form of vegetation from growing on the outsides of pots, two years ago we had a quantity of pots glazed outside—every part of them exposed to the eye—all the outside and about an inch of the inside from the top—thus leaving the portion of the pot in contact with the soil and roots just like ordinary pots. So far as greening is concerned it has been a perfect success; and, the colour being a quiet brown, the pots are more unobtrusive and pleasing in appearance than ordinary pots when clean. It is our intention to extend the system to all pots in moist houses at least. It saves an immense amount of labour, and we never had any doubt as to its effects on the cultivation. The common idea of air getting at the roots or soil through the sides of an ordinary garden pot, even when clean, to say nothing of when its pores are filled up with green slime, is not to our mind an appreciable point in practice. Besides, it may be accepted that sufficient air penetrates the ball up through the drainage and from the surface of the soil; and it is not, as a rule, the order of Nature that air gets to the roots or food of plants from a lateral direction. As to the stoppage of evaporation from the sides of pots, we look upon that in moist stove plants as certainly a small evil, generally speaking; and in the case of many plants it is a positive advantage. Rapid evaporation cannot in very many cases be regarded as a gain. The glazing of ordinary pots thus increases their cost about a third, but

they are more durable; and if any other cheaper process could be invented in order to keep pots clean it would be a great point gained in appearance and cleanliness. We have experimented by dressing the outside of pots with silicate and calcium, and the result has proved a failure; though the pots so dressed kept longer clean, they ultimately became green. It will be in the recollection of many that Mr. Beck, of Isleworth, many years ago was a successful prize taker at the London shows with *Pelargoniums* grown in small slate tubs. And those who have visited the Kibble conservatory in the Glasgow Botanic Gardens will have noticed how well tree-Ferns, &c., thrive in galvanised iron tubs, which are very light and, of course, very durable.—“The Gardener.”

TWO-SPATHED FLAMINGO PLANT.

THE annexed illustration is a good representation of this singular monstrosity, of the history of which I can give but little or no information. It was detected on one of a pair of seedlings purchased by me a year or two ago from Messrs. Veitch, and is interesting, owing to its being the first double-spathed form, as far as I can learn, in which the second spathe overlaps the other, the sport known and exhibited some years ago under the name of *Anthurium Scherzerianum Daviesi* having the second spathe at the other side of the stem, and altogether distinct from the ordinary spathe. This



Two-spathed Anthurium.

did not, I believe, prove constant, but reverted to the common variety. I only hope my plant will again produce a similar double-spathed flower next season.

W. E. GUMBLETON.

Belgrove, Queenstown.

Orchids in Bloom at Kew.—The following Orchids, rarely met with in private collections, are now in flower at Kew, viz:—*Arethusa bulbosa*, so beautiful a plant that one could wish it was more plentiful; its solitary nodding flowers are borne on slender scapes, 3 or 4 inches in height. The sepals and petals are of a bright amethyst-purple, and closely resemble the same organs in the old *Bletia verecunda*, while the lip reminds one of that of *Pleione lagenaria*, being slightly convolute, and having three-fringed lamellæ down its centre, while the sides are streaked with amethyst-purple. *Bletia verecunda* (B. Shepherdii) is now flowering freely in the same establishment, its bright purple flowers being borne on great branched spikes or panicles fully 4 feet in length. This plant is well worth growing for cut bloom, as the flowers last fresh a long time. Several plants of the white-lipped *Oncidium pulchellum* are blooming freely, as is also a small specimen of *O. andigenum*, a plant nearly related to *O. cucullatum*, the chief difference being that the ground colour of the flowers, which are purple spotted, is yellow instead of white, tinged with rose. A plant of *Bifrenaria aurantiaca* bears two spikes of bright yellow flowers, barred with rich brown, and is both distinct and ornamental.—B.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Seemann's Adiantum (A. Seemannii).—This noble Maiden-hair Fern has pinnae from 3 to 4 inches in length and more than 2 inches in width, borne on fronds about 2 feet long. It has been introduced by Messrs. Veitch, and deserves a place in every stove in which Ferns are grown.—B.

Acanthoriza Warscewiczii.—This is a rare and beautiful Palm from Costa Rica. The leaves are divided into two, three, or more segments, each segment being elegantly curved inwards, giving it the form of an inverted keel, furrowed at regular intervals with less conspicuous furrows between the deeper ones; above, the leaves are a bright glaucous green; below (by which the beauty of the plant is greatly enhanced), they are covered with a silvery down.—Q.

THE FLOWER GARDEN.

WALLFLOWERS.

MR. SHIRLEY HIBBERD gives some good advice about Wallflowers, in the “Gardeners’ Magazine.” “That Wallflowers,” he says, “should abound in beds and borders; on walls and ruins; in the reserve ground, and in the front lines of the kitchen garden, is of course most proper; but just come with me for one moment, and I will show you a place for Wallflowers which usually produces nothing at all, although if it were a Wallflower garden properly so-called the produce of the flowers sent to market would every year pay all the rent. We will first go amongst the plant-houses, and observe that many of them have brick walls of from 3 to 5 feet high that nourish nothing at all on the outside, and might be declared incapable of any out-door service by such as suppose it impossible to grow good plants in hard gravel. The finest Tomatoes have been grown here in a hard gravel walk, the roots having to search for their food amongst the stones and broken bricks and tiles of which the substratum of the walk consists. Let it be understood, then, that all these unoccupied walls rising out of hard walks are just the places for the very best of the Wallflowers, and especially for the old Double Yellow, which in a few years will, in such a soil and situation, rise to a height of 3 or 4 feet, and make a splendid return in the way of cut flowers from Candlemas to Midsummer Day, according to the season. They should not be nailed to the wall, but must be planted in the gravel, with a good soil to give them a start, at from 6 to 9 inches from the wall, and for ever after must take care of themselves, unless they grow inconveniently large, in which case the pruning knife provides some slight remedy. Every aspect, due north and bleak east inclusive, will suit Wallflowers. A further search in the same spirit will reveal bits of gravelly starving waste here, there, everywhere, and they may be all clothed with Wallflowers, if not overhung with trees or excessively damp in winter. The greatest cold ever experienced in Britain will not hurt the Wallflower, but damp, heavy shade, very rich soil, and a close atmosphere are its worst enemies; hence, although it may thrive at the foot of a wall, it would, if it could speak, ask to be planted on the top of it, for the song of the Wallflower is ‘Excelsior.’ In visiting gardens, one sees many failures as well as successes with this useful plant. It is a matter of the utmost importance to secure good seed, but the next thing to do is to manage it properly. I repent me that I did not pen these notes earlier, for it is my rule to sow Wallflower seed some time before the 15th of May, and I find that those I have of late been rejoicing over were sown on the 29th of April. This is a cold soil and a damp locality, and all herbaceous plants that have to stand the winter require careful management, or they disappear. On the chalk and on dry sandy soils anywhere, the seed may be sown any time in May or the early part of June, but I should say that Midsummer Day is the latest moment allowable; for, if they do not make a good growth and become well hardened before winter they will not flower freely in the spring. Our rule is to sow a few rows in the kitchen garden, and, as soon as the plants are large enough to handle, we transplant them into rows a foot apart and the plants a span apart in the row. By the middle of October they are stout and shrubby, and they are then lifted with good balls and put into their flowering quarters, where they become well established before the winter compels them to rest. It is not at all necessary to raise a stock every year, for the plants live any number of years if left alone; but, for bedding purposes, an annual supply is necessary, and the best thing one can do when they have done flowering is to throw them away. To let them stand in the beds is, we will say, out of the question, and to transplant them does not pay, because they want nursing at a time when there is more work than can be properly got through, and our best course is to reduce it by any legitimate means. Now, by raising a crop of Wallflowers from seed every year we reduce to a minimum this part of the work, and have the best show at the cheapest rate. But wherever the plants can be allowed to remain several years, and they are really good to begin with, they should no longer be regarded as annuals, or even as herbaceous plants. They then become flowering shrubs, and acquire a position of the highest importance in the garden. As to the sort of Wallflowers, that is another and a more important matter. Not many of our amateur gardeners are aware of the fine strains of Wallflower that are obtainable. If a particularly interesting example of the improbability of plants is wanted, we cannot do better than direct attention to the Wallflowers; for between the wild plant on the castle wall and the large-flowered variety of the garden wherein Wallflowers are a speciality, the difference is immense. It is a fact of considerable importance that there are many bad sorts of Wallflowers to be found in gardens, as there are also some remarkably good ones. I saw a short time ago, in the garden of my friend, Mr. Crute, Sutton, Surrey, a wall crowned with the most perfect examples of blood-coloured Wall-

flowers I have even seen, the colour being a deep sanguineous crimson, the flowers large and single, and the plants all one height, averaging from 10 to 12 inches. Such a strain is a treasure, and I can match it with a yellow that is the best of its kind that has ever come under my notice. This is called New Golden Tom Thumb. I know not its origin, but as I had the seed from Mr. Cannell, of Woolwich, I suppose it is obtainable at seed-shops. The plants are all exactly alike, as if turned out of the same mould, and we have not seen one "rogue" in a large piece of them. The average height is 9 inches, the growth compact and bushy, branching freely from the base, but making twigs rather than branches. The flower-buds have a most distinct character, being pale green, and inclining to whitish; the flowers are large, smooth, of a rich full, but soft orange-yellow, and the leafage is a brilliant grass-green without the slightest trace of any glaucousness. For all ordinary bedding purposes this, I take it, is the best Wallflower. We have also what we suppose to be a good strain of Belvoir Castle, dwarf yellow, but it lacks uniformity. The best of the plants are of dwarf bushy habit, with smallish leaves, which show a slightly glaucous gleam; the flower-buds are just tipped with brown; the flowers are produced in profusion, and the typical colour is clear canary-yellow, but a few come with streaks of brick-red, and those that are pure yellow are of two or three shades. As I have seen this same strain at Belvoir, it appeared purer than I have it; but if it were purified to the same extent as Tom Thumb it would be equally valuable, for its clear light yellow tint is as valuable in its way as the rich orange-yellow of its rival. It is commonly believed that it is impossible to raise good double Wallflowers from seed, but that is a mistake. I have had many a batch so thoroughly double and so splendid in colour that if one could but be sure of the seed, there would be no occasion for the rather tedious business of raising the old Double Yellow Wallflower from cuttings. When you have good seed it is as easily managed as Double Stocks, and one great point is to select the plants that are to remain carefully, so as to get rid of the bad colours and the single and semi-double kinds. It may be that a good strain of seed will produce varieties equal to the old Double Yellow, but I should be sorry to throw away that well-tried friend in order to put my trust in seed for the future. The habit of the plant is perfect, it makes a great shrub if encouraged by judicious shifting and pinching and allowed time to grow. To make stock of it a little gentle forcing should be resorted to, and the result will be plenty of soft shoots that will make the best cuttings, that may be struck with ease in a very mild heat. We do it in a more simple way. About the middle of June any number of cuttings may be taken from plants that have not been forced, and these are dibbled into pans of sandy soil, covered with a bell-glass, and put into a Cucumber-house, a green leaf being put over the bell-glass if the Cucumbers do not shade the cuttings effectually.

American Violets.—Of the twenty species of Violets, native to the Atlantic States, I have cultivated four which flourish well in the garden. Three of these have leafy, branching stems; the downy yellow Violet, with dark green leaves (*Viola pubescens*); and large white Violet, sometimes purple beneath (*Viola canadensis*), and the graceful pale blue spurred Violet (*Viola rostrata*). These bloom for a long time, and, if slightly shaded, the flowers are very large. The Hooded Violet (*Viola cucullata*) differs from these in having no branches. It bears each leaf and flower on a long scape rising directly from the root like the stalk of a Tulip. It bears an abundance of dark blue flowers in May and June, which are largest in a moist spot. It will grow anywhere. Its habits are so peculiar that it must be kept away from delicate flowers, for it greedily takes all the room it can get, and the thick, knobby root-stocks ramble over the ground, half in and half out, making, with the luxuriant foliage, a perfect mass of solid vegetable matter. As if this were not enough, after the showy blue flowers are gone, it continues all summer to produce quantities of seed from curious little flowers which grow directly upon the root, and consist only of an immense pistil surrounded by stamens.—"Cultivator."

Humea elegans purpurea.—This is higher coloured than the common variety, so much so that grown in the open air it merges into red in the deepness of its rose colour. Few plants are more graceful than the Humea, indoor or out. The catalogues mostly say they are very fragrant. Well, in so far as that means a powerful odour, pleasant or otherwise, the catalogues are right. Many are extremely fond of, others equally averse to the fragrance of Humeas. They give out little or none unless their leaves or flowers are bruised; if untouched they hardly reveal their proximity by their scent. They should be sown in the March of one year for flowering in the summer of the next. It is a good plan to grow them outdoors throughout the summer months at distances of 2 feet by 6. This for the first year, for final effect 6 or even 10 feet apart will be close

enough. Take up and pot them at the end of September, wintering them in a temperature of 45° to 50°. Shift them, if they are to be grown in pots, into 12-inch pots, using good loam to pot with in January; water freely as soon as growth commences, never in fact allowing them to get dry, and the plants will flower through the later summer and autumn months. For open air purposes plant out at the end of May. Place a stout stick to keep the plants upright, water in dry weather, and they will flower freely and prove highly ornamental from July to October or later. Tall flowering plants are often lifted and carefully potted before winter, and prove most useful for conservatory decoration. Occasionally too, a few plants will miss flowering; and if such are taken up and potted they will make trees the third season, each branch being like a common-sized Humea, and the whole plant like a dozen of the normal type knocked into one.—"Villa Gardener."

Percentage of Good Novelties amongst Seedlings.—The percentage of improved novelties amongst florists' flowers, that is to say, the results of cross-breeding amongst this particular class of plants, is thus stated by a correspondent of the "Gardeners' Magazine":—"Mr. Keynes, of Salisbury, sows every year, and has done for many years past, 30,000 Dahlia seeds, and he has averaged about ten named flowers every year for some twenty years or more, which is a very small percentage—it is one-thirtieth per cent; in this case it would seem that many good flowers must be lost, for 30,000 seedling Dahlias ought to give at least thirty varieties worth naming, or, say, one-tenth per cent. The late Mr. John Salter estimated that seedling Chrysanthemums worth naming averaged one in 2,000 plants, or one-twentieth per cent. Mr. Downie gives 500 Pentstemons or Phloxes to get ten first-rate novelties, this being at the high rate of 2 per cent. In the raising of plants that admit of manipulation, such as Pelargoniums, the rate is still higher, the result, no doubt, of the control the raiser exercises. In the case of Dahlias and Chrysanthemums the raiser has not much control, but he selects the seed-parents and watches over the growth of the seed, and that is control to some extent. There are cases in which the cross-breeder goes direct to his work, and, having in his mind's eye exactly what he wants, ensures it right off; but this is not an everyday business."

White Silene.—This is now in flower with me. Its foliage is small, and the blooms, which rise to a height of 7 inches, are borne on slender stems, and produce a pretty effect. They are five-petalled and serrated. Possibly some of your readers can give me its name.—A. D.

Dianthus High Clere.—This hybrid Dianthus is a useful plant for mixed borders. I have two plants of it now in my border, each of which has about twelve flower-stems, and each stem is crowned with fine trusses of bright rosy-carmine-coloured blossoms.—N. H. P.

Clematis ovata.—This showy-flowered species from Carolina forms a dense bush 2 feet in height, and bears deep blue flowers 3 or 4 inches in diameter. Associated with Vesta or other large white kinds, the different colours would have a striking effect.—B.

Bedding Pansies.—Are cuttings of these better than seedlings, and, if so, when should they be put in? Do seedlings come true to colour, and which are the best varieties of yellow, blue, and white for early spring blooming?—ENQUIRER.

Banksian Roses.—We have here two large plants of the white and yellow Banksian Roses, some 25 feet in height, growing in front of the Orange-house. The white is not so profusely bloomed as the yellow; nevertheless both are objects of exquisite beauty, which must be seen to be appreciated.—R. GILBERT, *Burghley*.

Flowering of an Old Variegated American Aloe.—An Aloe (*Agave americana variegata*), which has been carefully preserved for upwards of ninety years, is now showing bloom, and may be expected to be in full blossom, as near as one can judge, in about a fortnight or three weeks. How can I best protect the flowers so as to keep them in perfection as long as possible?—JAMES HARVEY, *Windhill Lodge, Bishop Stortford*.

Double-flowered Silene pendula.—This, unlike the double Cinerarias, is really worth growing, as its semi-double and double flowers are larger, of a richer colour, and continue in beauty much longer than those of the single kind. Indeed, this plant has in addition the merit of furnishing useful flowers for cutting, as many of the blooms are as double as those of a Pink. Lovers of spring gardening will find this double variety worthy of attention.—D.

Brompton Stocks.—These are very beautiful in borders at this time of the year, but are more abundant in small gardens than in the parterres of the rich. The giant scarlet, however, so massive and withal so fragrant, is worthy of a place in any garden, large or small. Not less beautiful, too, but much rarer, is the Giant White, a grand Stock that, when well grown, will produce marvellous spikes of bloom. I have seen them on plants 3 feet in height, 12 inches in length, and equally fine all round. This year my plants are not so large as I have had them, but I have already put out several hundred to flower next year, and, as these are getting established, I shall look for a grand display.—A. D.

Alyssum saxatile.—As a yellow early summer flowering plant, I know none to equal this, blooming, as it does, from the beginning of April until the end of May, and sometimes longer. Planted 6 inches apart, the heads of bloom meet and form an unbroken line or mass of intense yellow. In order to have it in good condition for next spring, preparation should be made at the present time. The bloomless side shoots, which are produced plentifully at this time, make the best cuttings, needing only to be pulled off and dibbled into growing material in some cool shaded place, either in or out of a frame, keeping them a few inches apart, when they form good plants for transferring to the flower beds in autumn. The beginning or middle of October is a suitable time to place them there, and their position should be near the edge, as they seldom attain a greater height than that of 4 inches.—J. MUIR.

New pyramidal Stock var. Mauve Beauty.—This magnificent novelty is the result of several years' careful selection, and has commanded general admiration for its great beauty. It has a true pyramidal free-branching habit, and forms a dense pyramid of flowers; colour, a lustrous pale mauve; it is a grand variety for exhibition purposes. It can be grown as an intermediate variety, if sown in August and September; and the fine examples of this stock shown at the Royal Horticultural and the Royal Botanic Societies' meetings in March, 1872, were so treated.

BOTH SIDES OF SPRING GARDENING.

The description of the spring flowers at Belvoir (see p. 450) makes us all desirous to possess such treasures; but, unfortunately, there is a dark side to the picture, to which attention is directed by another correspondent (p. 437), whose thoroughly practical exposure of the folly of attempting too much in the way of ornamental gardening will meet with a ready approval from many a gardener, especially where the double system of bedding is practised both in spring and summer. The usual time for bedding out—that is about the middle of May—is one of the busiest seasons of the year, both in pleasure grounds and kitchen and forcing gardens; whilst, at this time, wall trees, if not daily attended to, may be expected to receive permanent injury. Before the system of spring gardening came into fashion, the flower beds were, at planting time, in that condition in which a good kitchen gardener likes to see his seed-beds—moist and friable; but when just cleared from a crop of spring flowers, they are dust-dry and impoverished, and there is scarcely time to manure, dig, and water them, much less to pulverise, or get the soil in good tilth for planting—in fact, nothing short of removing it bodily and substituting for it fresh loam, can supply fitting beds for either *Calceolarias* or *Verbenas*; while, put in as well as the means will allow, they perish by hundreds. It is no wonder that succulents are getting so popular; for, unless a bedding plant will flourish on an ash-heap or house-top, it stands a poor chance in flower beds now-a-days. Some complain of the shortness of the autumn display, but how can it be otherwise, while two crops a year are grown on the same beds? I have seen lovely ribbon borders of Pansies and Daisies just about at their best—in fact, a cloud of blossom—removed to the kitchen garden, to make room for the next occupants. Surely, therefore, it is inconsistent to expect a continuation of bloom in autumn under such circumstances, more especially where the plants used for summer bedding all come into flower at one time. Under natural conditions, plants are continually coming into flower in succession—the Primrose and Wood Violet are succeeded by Wild Hyacinths, Veronicas, &c. For my part, I shall always admire gardens like the beautiful

one at Frogmore House, where the velvety undulating turf is enriched by an occasional bed, here and there, of hardy Azaleas, Kalmias, and Heaths; and where the trees and shrubs are in themselves objects of special attraction, just enough of spring, summer, and autumn flowers being grown to give colour to the scene. Under such conditions, the effect is always pleasing, and the reverse of that presented where bedding-out forms the chief attraction.

Henham.

JAMES GROOM.

The Artificial Bog at Glasnevin.—In this bog one may see many species of plants gathered together from far off districts. *Pinguicula grandiflora* is here in abundance, and quite as much at home as in its native localities. Those acquainted with the common

variety need only to be told that this is larger in all its parts, and well named *grandiflora*. For the information of those who wish to collect it, I will give, as far as I know, the localities in which it has been found:—In Kerry, Kenmare, Lusk, Mangerton, Brandon, and at Killarney it is very common, almost to the exclusion of any other. Interspersed over the bog in great profusion is the beautiful Bird's-eye Primrose (*P. farinosa*); this is a rare plant, and easy to naturalise in such a place as is here provided, for though not absolutely a bog plant, it must at all times have abundance of moisture. *Orchis latifolia* major is growing here in great luxuriance. I would not be surprised if the celebrated *Disa grandiflora* would grow and flower well in this bog; it corresponds as nearly as possible to the description given of its natural habitat, and as the *Disa* is plentiful in the gardens, it might be worth while to risk a plant, with a little protection for the first winter. It would be the more desirable to try the *Disa* when we see the success which has attended the *Sarracenia purpurea*, which has not only stood severe winters in this bog, but is at present in bloom, and, if I mistake not, will ripen seed. There are many other rare plants perfectly naturalised here, but those mentioned are those most worthy of remark at present, being in bloom, and I think I have said enough to cause your



Macrozamia plumosa (see p. 180).

readers when visiting the gardens not to forget the bog; and if they go into it with as much enthusiasm as I did they will have considerable difficulty in getting out of it again.—“Gardener’s Record.”

The Fox-glove, both Wild and Cultivated.—The wild Fox-glove of our hedge-rows is a favourite and pleasing summer flower growing here and there singly, or in clumps by the sides of the lanes, or in the woods; but its decorative qualities are best seen when growing in large masses. Wild Foxgloves seldom differ in colour; rarely is one seen that is not of the common red kind, and if one that is really distinct were found it probably would be torn from its roots and borne away in triumph. Garden varieties are not so circumscribed in this respect. In these the colours vary much, and include pure white, cream, rose, red, deep red, and other shades.

The great charm, however, of the garden varieties lies in pretty throat markings, consisting of spots and blotches of deep purple and maroon, and these, when seen in large flowers, make them resemble those of a *Gloxinia*, hence the name *gloxinioides*, applied to some finely-spotted kinds. The garden plants are more robust, the stems stouter, and the flowers much larger than those of the wild kind, and, altogether, they make at the present time truly grand border flowers. The seed being small, it is best sown in pans or boxes under glass early in May, and when the young plants are well up they should be placed out of doors to get thoroughly hardened before finally planting out. Where planted in shrubbery borders it is well to make clumps of three plants; as they produce a finer effect than when set singly. Not unfrequently the Foxglove blooms two years in succession; but, in all cases, it is well to sow a little seed annually.—ALEX. DEAN, *Bedfont*.

Climbing Roses after Flowering.—Will some of your contributors kindly tell me how to treat the *Maréchal Niel* Rose, now that it has finished flowering? It appears to me to be one requiring special treatment. It has flowered well this year, but the blooms were not so large as they were last year. As it is said that it ought not to be pruned at all, I contented myself with giving it some of Standen's manure, with plenty of clean water, and syringing it. The tree is planted in the border of a house about 20 feet long, and gets no heat in winter. It has nearly covered the roof; but it is getting very naked of shoots towards the bottom, which detracts from its beauty. I find my climbing Roses all apt to do that; but I begrudge cutting them back. I have a fine climbing *Devoniensis*, which is rampant in growth, but has the same fault; the buds appear to be blind. *Maréchal Niel* only flowers once a year with me; but it ought to bloom in the autumn, ought it not?—A. OWEN.

Origin of Polyanthuses.—How these old-fashioned flowers were first raised seems still to be an open question. I have raised some pretty kinds from seeds of our Meadow Cowslip; while, on the other hand, from seeds of the true or large-petaled *Polyanthus* I have raised Cowslips and plants resembling, to some extent, the true *Bardfield Oxlip*, but none of the specimens had even a resemblance of the wild *Primrose* of our hedgerows. I have had many plants in my garden bearing a very close resemblance to the Cowslip, from which I have no doubt they were originally procured. There are also thousands of specimens in cultivation called *Polyanthuses* which are nothing more than the pink variety of the *Primrose*. From the wild *Primrose* I have also raised many pretty varieties, but it is a remarkable fact that, if they are allowed to grow or are neglected, not manured, or frequently transplanted, they quickly revert to the old-fashioned but still favourite *Primrose*.—J. R.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Japanese Primrose in North Wales.—My plants of this out of doors are now magnificent, some of them being 2 feet 8 inches in height. Ought the large old plants to be taken up, divided, and re-planted at the proper time, or ought they to be left undisturbed? They are two years old.—A. O.

Windflowers at Kew.—*Anemone pennsylvanica* is now blooming freely at Kew, each bloom being about the size of a shilling. *A. sylvestris*, or *Snow-drop Windflower*, is also in bloom, and at first sight reminds one of a dwarf form of *A. japonica alba*, but the leaves are much more finely divided.—Q.

Iris reticulata not Flowering.—I have some plants of this that do not flower, and should be glad if any of your readers would tell me the reason, as I am very fond of the plant.—H. P. [Probably the plants require to get stronger. This charming *Iris* flowers freely in warm sandy soils; in fact, we know one garden where it is becoming almost a weed.]

Aubrietia Hendersoni.—Amongst spring-blooming plants, this *Aubrietia* must always occupy a prominent position from its neatness of habit, and the great profusion with which its lovely tinted violet-purple flowers are produced. It is unquestionably the most effective variety of *Aubrietia* that I have grown, and is one of those exceptional plants which cannot fail to please.—G. WESTLAND.

Packing Flowers for Travelling.—I was present lately at the opening of a box of Rose-buds (*Maréchal Niel*) in Covent Garden Market, and noticed that they were packed in short Grass, evidently taken from a mowing machine—the box being quite full. If care be taken that the Grass is neither too dry nor too wet, I believe that many delicate flowers, packed in this way, would travel long journeys in the hottest weather and arrive as fresh as if just cut.—W. T. P.

Viola pedata.—In reply to Mr. Dean's question (see p. 450), allow me to state that *Viola pedata* flowers freely, both introduced plants of it and those obtained from seed. I have seedlings of this *Violet* two years old in flower, and the third year they never fail to bloom well. There is another closely allied Canadian species called *Viola pinnata* sometimes sold for *pedata*, which does not flower, at least I have never seen it do so, although it always bears an abundance of seed-vessels.—T. S. WARE, *Hale Farm Nurseries, Tottenham*.

The Giant Scarlet Poppies.—These noble plants (*Papaver orientale* bracteatum and their varieties) are not at all sufficiently used, considering their magnificent effect in the flower garden or shrubbery when judiciously placed. They are perhaps seen to best advantage on the margin of a low shrubbery. They push up boldly among the shrubs, and with their great bright flowers light up the garden in a splendid manner. Another point in their favour is that they will grow without attention in any soil, and their foliage is somewhat Fern-like and graceful.—A. DAWSON, *The Cedars, Chiswick*.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Planting Celery, Sowing Peas, Endive, &c.—The main crop of Celery should now be planted, choosing showery weather for this operation, should such occur within reasonable time, as when the ground is moist and the weather dull the roots lay hold of the new soil more quickly than they could be induced to do by artificial watering. The last sowing of Peas may now be made where these are required as late as they can be had; but, unless in open favourable situations, the produce of such late sowings is precarious. Give them, as previously advised, plenty of room, by sowing thinly and having the rows placed far apart. Where Endive is required early, a little of the *Green Curled* variety may now be sown; but, as this early-sown crop is liable to run to seed, it is not well to have too much of it. Where Broad Beans grow strongly when they come into flower, they will be benefited by having their tops nipped off. This has the effect of concentrating the efforts of the plants to form pods instead of making useless growth.

Planting Broccoli.—Winter and spring Broccoli should now be planted, and if the plants have been treated as advised some time ago, they will now be fit for putting out. In the case of Broccoli, it often happens that with only a moderate frost great quantities of it perish. Except in extremely low damp localities, this is more attributable to the way in which the crop has been treated than to the kinds grown being tender or the situation at fault. In order to impart to the Broccoli that hardy condition of growth which is indispensable to its standing a severe winter, it should be planted widely apart; if planted too close, it is certain to be weak and soft, and almost sure to succumb on the first occurrence of severe weather. If the land on which it is to be grown is of average quality and fairly manured, the plants should stand a yard apart each way. Where ground is limited, this may seem extravagant, but it is false economy to run the chance of losing the greater portion of the crop through an attempt to grow more than the space at command will permit. On poor inferior soils, where the plants will not attain full size, they may stand 2½ feet apart.

Fruit.—Should the weather keep dry, Strawberries on light shallow soils will require water. This fruit succeeds best on heavy lands, and amateurs are often baffled in their attempts to grow it where the soil is of an opposite character. Under such circumstances, a plentiful supply of water, not only at the time when the fruit is swelling, but after it is gathered, is essential to the well-being of the plants, in order to enable them to make good growth, and produce large plump crowns for another year. Continue to remove all Raspberry suckers that make their appearance round the base of the plants, retaining only sufficient shoots for next year's crop. These may vary from four to eight, according to the strength of the plants. By removing all superfluous shoots those that remain will be much stronger than they otherwise would be, and in a better condition to produce heavy crops than when all the shoots that make their appearance are allowed to remain for no other purpose than to be cut away at pruning time. In gathering Gooseberries and Currants for bottling and similar purposes, a portion should be taken from each tree, instead of, as is often done, stripping the whole from some bushes and leaving others to carry all that have set. Thinning hardy fruits does not receive that attention from us that it does in France and in the Channel Islands. With us the cost of labour has doubtless much to do with this matter, especially where large breadths are grown; but, with the limited number of trees cultivated by amateurs, there is no excuse for such neglect. Apples, and in some places Plums, this season have set in such enormous quantities that, unless reduced by timely thinning, they never can possibly come to perfection. Some Plums, as *Victoria*, for instance, will set in great quantities, and remain until after the stoning process is complete, but, before ripening commences, they will fall off in such numbers, as to literally cover the ground. Ere this takes place they will, however, have so exhausted the trees as to leave them unable to swell off those that remain at anything like the size which they ought to attain, and in such cases the quality always suffers in proportion. Apples should in like manner be thinned; in the case of culinary varieties, where the trees are not so excessively laden, a good deal of the necessary thinning may be done by removing for use a portion of the crop as soon as the fruit is large enough, but under no circumstances leave a superfluous quantity too long on the trees. Dessert kinds where they are too thick should be thinned as soon as they have formed their pips. When this process is complete they will show what portion of the fruit will fall of their own accord. Pears, where still too thick, after they have cast off such as fall naturally, should in like manner be thinned.

Chrysanthemums.—These indispensable autumn flowering plants should be at once transferred to their flowering pots, the most suitable sizes of which are those of 10 or 12 inches in diameter. As

they get large and the soil is filled with roots these plants require great quantities of water; therefore, the pots must be well drained. Grow them in good loam, to which add one-fifth of rotten dung and a little leaf-soil, with sand sufficient to keep the whole porous. Chrysanthemums do not like light potting; therefore, make the soil firm, and do not fill the pots too full or the plants are almost sure to suffer afterwards through the want of space sufficient to hold water enough each time it is applied. With pots of the size advised there should be $1\frac{1}{2}$ inches space betwixt the surface of the soil and the top of the pot. Plunge the plants out of doors in an open place where they will get plenty of sun and air, but, where they will not be so much exposed as to get broken by the wind. The best material for plunging in is coal ashes, but, if these cannot be had ordinary soil will do. Tie each plant out as soon as potted, so as to lay the foundation for the future specimens, and to prevent their being injured by the wind; do not continue longer to stop the shoots. Give sufficient, but not too much water, until the roots have become established.

Primulas, Cinerarias, and Zonal Pelargoniums.—Both Primulas and Cinerarias, if sown as advised, will shortly be fit for placing in thumb pots, in soil consisting of three-fourths good loam and one-fourth rotten dung and leaf soil in equal quantities, with a good sprinkling of sand; when potted, put them into frames facing northwards, as these plants cannot bear exposure to full sunshine, to break the rays of which, when very bright, shade with a piece of netting or thin canvas. Cinerarias should stand on a bed of ashes that will hold moisture and maintain a humid atmosphere about the plants. They cannot endure being placed on shelves exposed to drying currents of air. Place Primulas on inverted pots, so as to keep them up near the glass, or they will become drawn and long in the leaf-stalks. After potting, keep the lights closely shut down at night, with only a little air on during the day until they have commenced to grow freely, after which give air plentifully night and day. Zonal Pelargoniums are useful for winter flowering, but they require to be specially prepared for this purpose. Last autumn-struck cuttings should now be placed in 6-inch pots, in ordinary loam, and at once plunged in coal ashes in an open situation, where they will be fully exposed to the sun. If older plants, that have been cut back, are used for the purpose, they will require a little larger pots, but, on no account, must they have too much root room, as the object is not to get large plants but such as are stout in growth and thoroughly ripened; it is not possible to make them too hard, as in that condition they flower through the winter with a little warmth, instead of running to leaf, as would be the case if they were vigorous and full of growth. Keep all flowers which they throw up during the summer removed as soon as they make their appearance; plants treated in this manner through the summer will bloom freely up to Christmas in the windows of an ordinary room where a fire is kept up, bringing them indoors about the middle of September, after which it is not safe to leave such plants out, as, if only slightly injured by frost, their flowering is interfered with. There are many amateurs who have not much convenience for plant-growing but who like to have their windows gay with flowers, and one of the greatest difficulties with which they have to contend is the destruction of aphides, to which their plants are subject, and which are not easily killed by fumigation where no proper place is at hand to apply it, and where only a few plants happen to be affected, the operation often gets put off until they are half spoilt. In such a case as this, the most simple and convenient remedy is to get an ounce or two of common Scotch snuff, and dust it over the affected plants, for which purpose use a bit of fine gauze, formed in the shape of a small bag; if this is found to be too open, use the gauze double, and, in applying the snuff, lay the plants down on their sides over a newspaper—by this means there will be no waste, the paper catching all that does not stick to the leaves. There is one thing to be observed in this as in all other methods of destroying insects on plants, and that is the snuff must be applied in such a way as to reach every affected shoot and leaf, otherwise the destruction will only be partial. Allow it to remain on for a few days, after which the plants may be again laid on their sides, and the snuff washed off by syringing with clean water.

Vineries and Peach-houses.—Continue to treat Vines in their several stages of growth as advised in previous calendars; look well to the foliage being free from red spider, as upon this, to a considerable extent, will depend the condition of the fruit when ripe, and also the state of the wood for next year's crop, as, next to over-cropping, nothing tends to weaken the constitution of the Vine so much as allowing its foliage to suffer through the ravages of red spider. If the use of the syringe has been continued daily, as recommended some time back, there is not much danger of this pest being troublesome; if, on the other hand, little water has been thus applied, it may now be expected to make its appearance. When

discovered, the affected leaves should be carefully sponged with clean water, on both upper and under surfaces, in addition to a subsequent thorough syringing. Allow Peaches to be fully exposed by removing all leaves that shade them. Syringe the trees daily, in order to keep the foliage clean.

Indoor Fruit Department.

Vines.—Encourage free growth in the case of all young Vines planted out this season, by closing the ventilators early in the afternoon, so that the temperature may remain about 90° for an hour or two at that time. Damp all bare surfaces, and use the syringe freely where the slightest indication of the presence of insects can be detected. Do not let the growths on one-year-old spring-planted canes become crowded, which they are apt to do about this time. The leading rods, which may have been allowed to grow to make a quantity of foliage for forming roots, should never be permitted to come nearer than a foot of each other, and the lateral growths produced on these must be kept in to the first leaf. Where only one or two canes have been taken from each root, the secondary growths may be left longer, their length being regulated by the space there is around them. Vines planted last season and brought into growth early without forcing will now be getting well established. Bunches will be appearing on the strongest rods, and the number left on must depend on the capabilities of the Vine. Some may be allowed to bear two, and others four and five, but it is always best to crop lightly when at this age, or the Vines will be liable to become prematurely impaired in health; no bunch should be left on the leading shoot, the great object being to get that as perfect as possible for next year's supply. Those who have plenty of Grapes on older Vines will lose nothing by not fruiting young Vines of this age till next season; but temporary ones, planted along with them, may be cropped heavily, as some of them may have to be dispensed with next spring. Those planted two years ago should produce some fine Grapes this season. The size of the bunch and strength of the Vine should determine the weight. When well regulated, a bunch on every alternate shoot on the lower portion of the rod is an average crop for ordinary Vines.

Pines.—Successional plants, intended to furnish supplies about October and November, should now be showing fruit; with mid-summer light and air, little difficulty need be experienced in bringing the fruit well and rapidly up when it is formed, but bottom-heat must not be neglected, as, even at this time, it is of great advantage to the healthy condition of the young fruit. With a little attention, the desired bottom-heat may be derived from the plunging material alone. If the fruiting plants are amongst others not so far advanced, those showing fruit should be taken out and plunged in a bed by themselves; but, before doing this, work in some new plunging material, and a little fire-heat for a night or two will start a bottom-heat sufficient to keep about 85° for a long time. When they are not re-plunged, the material, which may have subsided, should be watered and firmly well pressed up to and around each pot.—J. MUIR.

Peaches.—To prevent ripe fruit falling to the ground and getting spoilt a good plan is to suspend a herring-net under the trees in a series of founces or doubles so as catch the falling fruits and yet not allow them to fall too far and perhaps knock against each other, as they would do if all fell into one part of the net. Succession-houses may be kept closer and warmer than those in which the fruit is ripening and syringed more liberally. Houses in which the fruit is stoning should be carefully attended to during bright hot weather, giving abundance of ventilation early; a slight shade would also benefit the trees at mid-day during hot weather. At this stage, at which an overstrain would have the tendency to cause the fruit to drop, see to the final thinning of the fruit in orchard-houses, and take care that the borders are abundantly moist as a precaution against red spider and blight; for, sure enough, those enemies will at once attack a tree in distress. The crop must also suffer if the roots be dry, and if the fruit gets stunted from dryness now no after management will bring it up to the required standard. The front ventilators may be kept open day and night when the wind is south or south-west.—W. D. C.

Flower Garden and Pleasure Ground.

The greatest possible order is now indispensable in this department, and the growth of the various climbing plants used for covering wire-work of any kind, walls, pillars, or arches, must therefore be frequently regulated. Stake and tie up tall-growing plants, and peg down such trailers as the various kinds of Verbena and Petunia. In geometrical flower gardens the height and habit of the plants used should be well considered, as this is quite as necessary as is the proper arrangement of the various shades of colour; therefore every effort should be made to keep all lines well defined and even in height; while, the judicious disposal of standard plants, or single specimens grown in any desired form, will have the effect of pre-

venting anything like monotony. Let all such plants be carefully and neatly staked; for, if this operation is unskilfully performed, a bad effect will be produced. Beds and borders planted in the carpet style will require unremitting attention, as regards regulating the growth of the plants employed in that way; strong shoots must be stopped and pinched back, in order that the surface of the beds may be covered as soon as possible; and care must at the same time be taken to preserve the pattern or plan of the beds, the divisional or marginal lines of which are generally formed by some of the most compact-growing succulents, such as the *Echeveria secunda glauca*, *Sempervivum californicum*, &c.; while the various shades of colour required to fill in and complete the pattern, are furnished by such plants as the various species of the high-coloured *Alternantheras*, the Golden-Feather *Pyrethrum*, or *Stellaria graminea aurea*. The latter appears to be an exceedingly useful plant for this style of gardening; but for small beds it will probably be found to be less manageable than the *Pyrethrum*, and the shade of colour is the same, or nearly so. For the production of neutral tints, the various *Sedums* will be found useful; and if it be considered desirable to use flowering plants at all in carrying out this style of planting, the most useful for the purpose will be found among the dwarf *Lobelias* of the pumila section. Since we have had the benefit of some refreshing falls of rain, annual flowers of all kinds have made considerable progress, and will require thinning out wherever they are found to be too thick upon the ground. As has been formerly stated, a flower garden, furnished or planted chiefly with a good selection of these plants, need be little, if at all, less interesting than others where ordinary bedding plants are alone used. Various kinds of deciduous shrubs will now be out of bloom, and should be cut back when it appears necessary. Hedges, formed of the tree Box, and of Privet, or other free-growing plants, will require clipping at this time; and, to keep such hedges in good order, it is necessary to perform this operation twice, or even three times, during the season.—P. GRIEVE, *Culford, Bury St. Edmunds*.

Roses.

The May-bug and cockchaffer are very plentiful in some localities this season, and often do great damage to Roses coming into flower; for they eat all the tops off the petals of the flowers as they open. They lurk under the foliage or in the centre of an open Rose during the day-time; and, by carefully looking over the plants, a great many may be destroyed. They are amongst the most destructive garden pests that exist. The grub lives in the ground, feeding on the roots long before transformation takes place. Also see to picking off all caterpillars. Aphides can be washed off by means of forcible applications of the syringe, and the use of Quassia-water. All who intend to exhibit cut Roses should go over their plants, and thin out the clusters to one bud every two or three days, so as to get the flowers open at one time, and improve their size by thinning out at intervals. The exhibitor has a better chance of getting the flowers open to the day than by trusting to thinning all flowers at one time. If he requires a stand consisting of, say, twenty-four varieties, he should select about forty of his best Rose-buds to cut them from; thin out the cluster to one bud, and this should always be the top or centre bud of the cluster. By repeating this operation about three days afterwards an even collection of flowers may be secured all in perfection at one time. Water freely, as Roses require feeding well if wanted for exhibition purposes. For outdoor Roses stable manure-water is as good as any that can be used. If the days are very hot and the sun's rays powerful it is advisable to use paper shades or the edges of the petals will be destroyed, and the Rose will thus be damaged for exhibition. Pot Roses out-of-doors will be found, in many cases, to be slightly attacked by mildew, which should be at once stopped by sulphur or Ewing's mildew destroyer.—H. G.

The Wild Goose Plum.—It is a curious fact that in America, where our European Plums are, for the most part, killed by the Curculio and the borer, this kind is said to escape. Its great value consists in its early maturity; it ripens from the 17th to 25th of July, a time when most markets are almost without a supply of fresh and attractive fruits. Secondly, it is of good size, form, and colour, being of the brightest light crimson, $1\frac{1}{2}$ inch long by 1 inch deep. Thirdly, the excellent quality of its fruit for eating, sauce, and preserving, is remarkable. It can be taken from the tree as soon as it begins to colour, while still hard, packed, and shipped to distant markets; it ripens perfectly while on the way, and will keep for some time after it is fully ripe. The tree is vigorous in growth, highly ornamental, and easily propagated, and when budded on the Peach, on which it grows perfectly, does not throw up suckers, and has no objectionable features.

THE GARDEN OF THE ELYSEES.

A TYPE of a large class of Parisian private gardens is that of the palace now occupied by Marshal McMahon. The too frequently accepted notion is that, given a small garden in a city, it should be geometrical in design. This was exemplified in our own stiff and stony Kensington. Frequently persons alluded to the difficulty of treating this garden in any other way. But there are only apparent difficulties in the way, as anyone can see by examining such gardens like that we now illustrate. Here we have streets, high walls, houses, and all the other impediments to good effect in landscape gardening, and yet a quiet fresh charming result is produced. It is always easy by judicious planting, to hide objectionable surroundings, and, both in Paris and London, many deciduous trees attain almost as noble proportions as in their native forests. Then in those French town gardens they have a way of covering objectionable surfaces with a lovely mantle of Irish Ivy, so carefully pinched and tended that in winter or summer the effect is charming. In this way trellises, high railings surmounting walls, gates, &c., are not only rendered inoffensive to the eye, but really made to add to the charms of the garden by the great extent of rich glossy verdure which they support. There are cool shady walks here, too, quite as refreshing in their way as many away from cities, and there is fresh Grass kept green at this season with abundance of water, and there is a pleasant and open lawn—though a small one. The absence of the idea that we should be excessively geometrical accounts for this. Without the little open lawn as a foreground, so to speak, the garden picture would be, to a great extent, lost. It is instructive to compare this picture with one of the old Dutch or other geometrical gardens frequently represented in old engravings, or with some modern English geometrical gardens, sometimes supposed to be "original" in design, but which are simply reproductions from times when people had not half a dozen kinds of evergreens—when simple conventional figures were sufficiently appreciated to be worth delineating on the ground. In these private French gardens it is unusual to have any regular or formal set of beds, and this we think a great improvement. One half the miserable formalities existing in our gardens arise from the presence of a series of formal "figures," or beds, which have to be filled once or twice a year, in the hope of making them look somewhat presentable—a result seldom obtained. Natural or artistic they can never be. If one desires to place some favourite plant in one of these beds, the chances are that it may not be done for fear of violating the unity of character which the whole should possess. A beautiful garden may be made without a set of formal figures of any kind, and by the adoption of one or more types of beds, such as circles and ovals, placed here and there in the spots we desire to embellish with flowers, either singly or in groups. This is the way now common in many recent French gardens. The very common mistake of forming small pools of water near a house exists in French gardens as in our own; and usually the water is stiff in outline, and not by any means an addition to the charms of the garden. The wise landscape gardener will not attempt that which he cannot do well. In a small garden no satisfactory effect can be produced from water, except in the form of a clear rivulet. S.

The Nomenclature of Hardy Plants at Kew.—The nomenclature in the herbaceous department here is capable of improvement, judging from the following from the "Gardeners' Chronicle":—"The bed of Aquilegias evidently needs re-naming, as a dark blue is named *Aquilegia glandulosa alba*; a reddish-peach kind, *A. Whitmanniana alba*; and *A. blanda azurea alba* is the purest white in the whole bed." Anybody acquainted with the garden, and at all familiar with plants, knows that the same kind of neglect is observable in the case of many other families. With the most liberally-endowed and probably the most accomplished botanical staff in connection with any existing establishment, the public have a right to expect more than this. In the herbaceous part of the Garden of Plants, at Paris, every plant is labelled as accurately as in an authoritative work, or in a good herbarium. We may add, that a botanical garden does not fulfil its simplest and most essential object if it does not show us plants properly named. No such errors as the above are evident in many nurseries or private gardens, devoid as these usually are of any trustworthy means of identifying plants.

VIEW IN THE GARDEN OF THE ELYSEES.



THE FRUIT GARDEN.

AMERICAN PEARS.

By C. M. HOVEY.

I WAS much interested and highly pleased with M. Jamin's "List of Pears worth growing," given in your last volume (1874, p. 455), and his general remarks thereon. No one is better able to impart information upon the subject than M. Jamin, and no one has done so more completely. At no fruit-growing establishment in France was I so much gratified as at M. Jamin's, and when there I added many kinds to my collection which he recommended as desirable sorts. Among them was one very fine summer Pear which he does not notice, viz., the St. Menin, or Omar Pasha; this I received from M. Jamin in 1845, and in 1855 I purchased, among other new Pears, the Omar Pasha, which proved to be the same. It is a good sized Pear, very high flavoured, and really excellent, but does not keep long. I consider it much better than any of the August Pears which he names, except Williams's Bon Chrétien, which, with me, is a September Pear. Much has been said in reference to Pears being adapted to particular localities, but though some sorts are fastidious, I am of opinion that the greater part will grow wherever good culture is given them. What has always puzzled us Americans is that Knight's Monarch should still be rated as a fine Pear in England, as, with us, it is worthless, and we see M. Jamin tells the same story. I had supposed, many years ago, that the kind which I cultivated could not be the true one; and in 1844 I selected some trees of it in London, several of which I planted, expecting great results. But from that day to this I have never seen a Pear of it fit to eat, and have grafted over all the trees but one. The only reason that I can see why Knight's Monarch does not succeed with us is that our climate is not cold and damp enough for it. Mr. Knight was unfortunate in selecting the Crassane as the parent of his seedling; had he taken Williams's Bon Chrétien the result might have been different. I was somewhat surprised to find that many of the Pears which we grow sometimes very fine, as standards or dwarfs, require a wall in France. I had the impression that where the European Vine will grow, the Pear would flourish without assistance. Of the several varieties of Pears which M. Jamin specially names, I have found the following excellent here as standards:—July: Summer Doyenné (Doyenné d'Été) and Beurré Giffard. August: Williams's Bon Chrétien (Bartlett). September: Doyenné Boussoch, Beurré Superfin, Beurré Hardy, Louise Bonne of Jersey, and Fondante d'Automne (Belle Lucrative). October: Beurré Bosc, Marie Louise, Beurré d'Anjou, Doyenné du Comice, Beurré Clairgeau, and Duchesse d'Angoulême. November and December: Winter Nelis and Joséphine de Malines. These are all the Pears on M. Jamin's list that I have found profitable or trustworthy for cultivating as standards, for I wish to have it understood that all our trees are standards or dwarf standards. Some of the others grow well enough, but are poor Pears, and some of them can only be grown in favoured localities, under high culture; in fact the following have been discarded, and some of them placed by the American Pomological Society among the rejected sorts, viz., Bergamotte d'Été, Beurré Gris, Van Mons, Doyenné Gris, Soldat Laboureur, Bergamotte Crassane, Figue d'Alençon, Orpheline d'Enghien, Beurré d'Hardenpont, St. Germain d'Hiver, Passe Crassane, Bergamotte Fortunée, and Bon Chrétien d'Hiver. Bergamotte Fortunée is thought to be about as good as a Turnip. In California the Easter Beurré and Glou Morceau are fine, and grand Pears they are when grown as California alone can produce them. Now, you may ask, if we reject so many once fine Pears, what we have with which to supply their place? Well, our answer is American Pears, of which we have now over one hundred fine sorts. A few of these appear in English catalogues, but only a few, and I am surprised that they are so little known to your pomologists. To be sure they have nearly all been introduced to notice since 1835, and some of them within ten or twelve years—nearly long enough to get well known, even abroad, though it takes a long period to find the real value of a new Pear. We hardly want a better Pear than Doyenné du Comice, or even Beurré Hardy or Beurré

Superfin. It will be a long time before these are excelled. But what cultivators do want, even if not quite up to this high standard, are kinds that can be relied upon—such as will bear a full and certain crop under ordinary culture, attractive in appearance, excellent in quality, and kinds that will find a ready sale in the market. This is what we have been aiming at; and, when our climate is considered, we have made good progress. I should like to see them fairly proved in England. I will name and briefly describe such as we have found to be of the character just named, premising that I do so after a careful trial of from twenty to thirty years; and as some idea of what that trial has been, I give you the number of kinds of Pears from which we have gathered one or more bushels of fruit each year, and the whole crop for the last ten years:

Year.	Varieties.	Whole crop. Bushels.	Year.	Varieties.	Whole crop. Bushels.
1865 . .	94 . .	711	1870 . .	85 . .	938
1866 . .	101 . .	728	1871 . .	120 . .	1,016
1867 . .	75 . .	531	1872 . .	105 . .	683
1868 . .	70 . .	744	1873 . .	135 . .	1,637
1869 . .	70 . .	594	1874 . .	130 . .	1,154

All the trees were perfect pyramids ten years ago, but have been pruned to 3 or 4 feet, in consequence of the lower limbs obstructing the walks, upon each side of which they are planted, just 6 feet apart, and 3 feet from the edge, the whole making a continuous line, if in one row, over a mile long. At the quarter-centennial of the American Pomological Society, held in Boston, September, 1873, we exhibited 328 varieties, our entire collection exceeding 500.

July and August.

The only Pears which ripen in July in Massachusetts are the old Amiré Johannet and Doyenné d'Été.

Manning's Elizabeth.—This is not, correctly speaking, an American Pear, but an adopted one, as the scions were sent by Van Mons, in 1833, to the late Mr. Manning, with several others, under numbers, Dr. Van Mons requesting Mr. Manning to name them, should any of them prove good. This was the only one of any value. It is a very beautiful and very fine Pear; small, but sugary, melting, and exceedingly rich. It is golden-yellow, and just one-half of the Pear, transversely at the crown end, is of a deep rich crimson, usually edged with a line of russet, and the remainder golden-yellow. It ripens about the 10th or 15th of August. The tree is only a moderate grower, and of somewhat regular yet open habit, but a good bearer.

Brandywine.—A most delicious variety, of good size, shaped like Beurré Giffard, much russeted, possessing a decided vinous and piquant flavour, full of sugary juice. The tree grows even more close than a Lombardy Poplar, with vigorous long branches, and every other year they are weighed down with the crop. One of the very best. Ripens about August 20th, and is a native of Delaware.

Boston.—A very remarkable Pear, coming nearer to the old White Doyenné than any Pear when gathered in proper time and house ripened. If allowed to hang on the tree too long, it becomes mealy. Of good size and Doyenné-shaped. Skin, clear golden-yellow, with a polished waxy surface, and a cheek of pale blush. An enormous bearer every other year. Tree, very vigorous and of good form. This Pear bears upon the tips of the new shoots, and if these are shortened more than half, the crop is lost. Ripe, August 25th, and will keep two weeks.

Bloodgood.—A Pear of decided character, of fine flavour, with a yellow skin, mottled and traced with russet. Ripens August 25th. The tree is a slow grower, of fine habit, and a heavy bearer.

Moyamensing.—A summer Pear of much excellence, in the old Doyenné style, every Pear having a slight suture on one side like a Peach. It has a smooth yellowish-green skin, very melting, but does not keep long. The tree is moderately vigorous, erect, and productive, the fruit ripening August 20th.

Clapp's Favourite.—One of our newest Pears, as large or larger than Williams's Bon Chrétien, and ripening from August 25th to September 7th. It combines the qualities of the Flemish Beauty and Williams's Bon Chrétien, and has not the disagreeable musk of the latter. It is very handsome, with a broad deep crimson cheek. It should be gathered

early, and it is not a long keeper; but, for its season, is the largest and among one of the best. Tree, very vigorous, and a good bearer.

Sterling.—Another very handsome Pear of roundish form, good size, with a lemon-yellow skin, and bright red on the sunny side. It is not strictly first-rate, but is better than Citron des Carmes or Bergamotte d'Été. The tree has an open, rather spreading habit, and bears a heavy crop, which will keep two to three weeks.

These may be considered the choicest of our summer Pears, but the following are good:—Deardorn's Seedling, Osband's Summer, Ott, Muskingum, Tyson, Cushing, Julienne, Harvard, &c.

September.

Hanners.—This is an early St. Germain, having all the qualities of that fine old Pear when in perfection. It is of good size, yellowish-green skin, juicy, melting, refreshing, and excellent. It is a vigorous-growing and fine-shaped tree, producing abundantly, but the fruit does not keep long.

Adams.—A fit companion to Williams's Bon Chrétien, but of regular and handsome form, exceedingly beautiful, with a waxy-yellow skin, and fine rosy cheek. It has a rich vinous flavour, very melting, and keeps a long time. The tree is only moderately vigorous, but of a good pyramidal shape, and bears well.

Excelsior.—This fruit has the general appearance of a Bon Chrétien, but is not so large, and has a skin thickly covered with dark points. It is remarkably vinous and rich, and has quite a new and peculiar flavour. Bears in clusters, and is very productive. The tree is irregular, with peculiar Apple-tree-like wood.

Andrews.—This is a Pear that has been known for fifty years, and can be traced back nearly a century, yet is now as perfect as when I first knew it. It is sometimes called the Water Lily Pear, the skin having the delicious fragrance of the flowers of our Nymphæa. It is one of the best September kinds, has an oily skin, rich juice, and a delicate aroma. It succeeds the Bartlett (Williams's Bon Chrétien). The tree is a very slow grower, in consequence of its great productiveness, and the fruit keeps well.

Moore's.—This is a fine Pear, and would stand very high but for its habit of falling from the tree, and its liability to be worm eaten. Why every fifth Pear should be wormy, when other Pears growing next to it should be perfectly free is a curious fact. Probably these pests select the best. It ripens in succession up to October 15. Very large, very beautiful, and very excellent. Twelve perfect specimens make the most attractive dish of Pears we ever saw. They should be gathered early. Tree vigorous and erect.

Besides these select sorts we have the Cabot, Collins's, Edmond's Buffum, Knight's R. I. Seedling, Lodge, Ontario, Johannet, &c.

October.

This is the month with us—rich in fruits, as M. Jamin says of September—and the sorts are so numerous that the fruit grower must be very careful in his selection, unless he has plenty of space. In fact, it is hard to reject any, so fine are the sorts. I place at the head of the best the

Sheldon.—A roundish russet Pear of long size, combining all the high flavour of Gansel's Bergamot, without its grittiness, with the rich juice of the Doyenné Gris, from which I have supposed it was a seedling. You never tire of eating it, and the large size and keeping qualities of the fruit, as well as the productiveness and beauty of the tree, all stamp it as the best October Pear.

Pratt.—This ranks nearly as high as, but is an altogether different Pear from, the preceding. But its excellence consists in its melting sugary quality and juiciness rather than its flavour. The tree is a magnificent one, growing erect, and yet the fruit is so abundant and heavy that the upright limbs bend till they nearly touch the ground with their weight, and there are no small Pears—a fault with too many sorts. The skin, yellow, traced with pale russet.

Hull.—Another enormously productive and very fine fruit, not remarkable for flavour, but melting, sugary, and rich, like the Doyenné. The tree is spreading, and slightly pendulous, of vigorous growth, and bears large crops of fruit.

Swan's Orange (erroneously called Ononduga).—A Pear almost identical with Beurré Superfin, except in colour and shape. It has the same rich sharp acidity which is so much liked by real Pear lovers. But the Swan's Orange, as its name indicates, is of a rich deep yellow, very handsome, and attractive. It should be gathered early, or it loses much of its excellence. The tree is vigorous, and is a regular bearer every year.

Seckel.—This was sent to the London Horticultural Society in 1818 by Dr. Hosack, and described, with a coloured plate, in the "Transactions of the Society," and is too well-known to need any description.

Merriam.—One of the most popular, though not one of the finest, Pears. Large, round, russety, bearing enormously, and when gathered in time, coming very near to a first-class Pear for excellence, as it is first in every other quality. It may be gathered and handled like Russet Apples, keeps four weeks, and is rarely in good order till gathered two weeks. If left on the tree too long, it becomes mealy. The tree is very vigorous and spreading.

Washington is a small but luscious Pear, very beautiful, with almost the exact appearance of the Forelle or Trout, the red cheek being covered with the spots peculiar to the latter. It is as delicious as it is beautiful. The tree is moderately vigorous and productive.

Other October sorts are the Heathcot, Tea, Mount Vernon, Kirtland, Oswego Beurré, Huntington, Admirable, &c.

November.

Kingsessing.—This is another large, handsome, and good Pear, similar in shape and about the size of a medium Duchesse, with a yellow skin and red cheek, keeping a long time, and of excellent quality. The tree is very vigorous, erect, and bears abundantly, its only fault being that the very heavy fruits are subject to be blown off in high winds, its short stem not yielding to the breeze like the long and slender-stemmed sorts.

Abbott.—The French have a Pear which they call Beurré d'Amanlis (Long de Moukowsky), or Almond Pear; but of all the varieties we have ever tasted, the Abbott has the most pronounced Almond flavour. It is a very beautiful Pear, with a waxy yellow skin and red cheek, and, when properly grown, is a good medium-sized fruit. Its only fault is that it bears so enormously that the fruit requires thinning-out to attain a large size. The tree grows like a Lombardy Poplar, and the fruit keeps from two to four weeks.

Fulton.—One of our oldest American Pears, but yet not extensively cultivated. It originated in Maine, and is very hardy, but the tree is only a very moderate grower, and fine young trees are always difficult to procure. It is best to graft on strong old stocks. It is an abundant bearer. The Pear is roundish, flattened, has a very rich deep russet skin like Beurré Bosc, and is nearly or quite equal to that Pear in quality.

Howell.—Here we have a really excellent November fruit, of large size, pyriform shape, a clear waxy skin of a lemon colour, often touched with light red in the sun, and profusely covered with minute specks. It has no very noticeable flavour, but is full of a very brisk sub-acid juice, refreshing and rich. The tree assumes a somewhat open, irregular shape, and the long branches, when loaded with fruit, nearly touch the ground. It comes in just after the Urbaniste, when there are but very few good Pears, which gives it additional value.

December.

Our winter Pears are yet few, but these few are good, and though accessions to winter sorts are the least desirable, we hope for some addition of new kinds as good as Dana's Hovey, which will keep well till April. Winter Nelis, Beurré Langelier, and Caen du France are about the only foreign kinds which produce fruit except in favourable localities and under favourable conditions, and then with uncertainty; but when the Columbia, and, soon after, the Lawrence were introduced, we were sure of plenty of fruit. The Hovey now fills the early winter season with the most luscious of all Pears.

Lawrence.—This is a Pear quite unlike any of the French or Belgian varieties. It is not buttery, like the Glou Morceau

or Easter Beurré; nor is it watery, like Beurré Langelier. It has a good consistence of flesh, yet is perfectly melting; it has no marked flavour, but is a mass of rich sugary juice—too sweet for some Pear lovers. The fruit is of a good size, clear lemon-yellow at maturity, with a very thin and tender skin, which will not bear rough handling without discolouring its surface. The tree grows freely, much branched, rather slender wood, and rather slow in coming into bearing, but producing very heavy crops. It usually keeps up to the middle of January.

Columbia is a huge Pear, in shape and appearance like a Lemon, with a long stem, and is a very juicy and refreshing Pear, keeping well till February or March. It is very apt to be blown off the tree in any high wind, which renders it ineligible for exposed situations. The tree is a very strong grower, of spreading habit, and a good bearer.

Dana's Hovey.—This variety concludes our list of our select autumn Pears. What the Greengage is to other Plums, or the Muscat to other Grapes, that the Hovey is to other Pears. It is not much larger than the Seckel, and, when gathered in October, has a dull greenish, quite uninviting, look, but as it begins to mature the green changes to brown, and the brown to russet, till, just at the period of eating, they become of a ruddy golden hue, really charming to look at. They are then more like huge drops of confectionery than Pears, the mere cutting of one setting free the delicious aroma, and perfuming the air. The tree is as marked as the fruit, strong, and stocky, with very blunt shoots, and leaves almost as thick and glossy as a Camellia, bearing in clusters, uniform in size, and good size if well thinned, a single tree producing 8 bushels. It begins to ripen December 10th, and continues up to the middle of January.

Curious as it may appear, yet it is a fact that scarcely one of the Pears we have described will grow upon the Quince stock. Some will grow for a few years and then stop; others will not budge a foot. Therefore all these must be grown on the Pear stock. As regards the character of the Pears which M. Jamin enumerates, and which I have stated are comparatively worthless with us, my experience is just the same as that of M. Jamin, who states (p. 458) "that it is only when grown on a wall that most of them (the winter Pears) produce fruit worth speaking of. We should therefore," he further says, "reserve our walls for them to the exclusion of other varieties, which will do pretty well in the open ground." All the kinds I describe do perfectly well as standards in any situation. There are few or no wall Pears in America. I have a line 200 feet long of single cordons, trained obliquely, comprising sixty varieties, just coming into bearing, and I hope for good results. All these Pears have been described and figured in the "Magazine of Horticulture," and several of them with coloured plates in the "Fruits of America," but I hope this brief account will not be without interest to your pomologists.

Boston.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

The Sea Apple.—Can any of your readers inform me what this is like, and where it is to be found? When touched by the finger, I have been told, it explodes like a puff-ball.—*QUERIST.*

Four Good Forcing Strawberries.—We have this season forced thirteen varieties of Strawberries, and from among them I can strongly recommend the following four, viz.:—Vicomtesse Hericart de Thury and Keen's Seedling as early kinds, and President and Princess Alice Maud as late sorts. If a fifth is required, add Sir C. Napier.—*W. M. STICKLAND.*

Aphides on Currant Bushes.—This pest has again made its appearance in this neighbourhood. The best and cheapest remedy for it is to cut off the curled ends of the shoots and then wash the bushes vigorously with the garden engine. There is nothing like a stream of clean cold water for dislodging insects and cleaning fruit trees of all kinds. If we had time to do this often enough, no insecticide would ever be required.—*E. HOBDAK, Ramsey Abbey.*

Chinese Peaches.—Some varieties of these, according to Dr. Kellogg, grow to the height of 40 to 50 feet, and produce fruit of great size. Marco Polo saw a Peach in the district of Cang-chew that weighed 2 lbs. In general, the larger sorts are considered to be of inferior flavour, although some Peaches in the Emperor's District are said to be as exquisite and meltingly delicious as the best European kinds. Chinese gardeners have the secret art of preserving the fruit gathered in October until January, as perfect in flesh and flavour and as smooth as in the fresh state. It should be noted that in China Peaches are budded upon stocks raised from seed of the choicest varieties.

THE KITCHEN GARDEN.

FORCING FRENCH BEANS.

It was some time after its appearance in *THE GARDEN* that I observed Mr. Gilbert's expression of surprise (p. 416) at the statement that I had 300 pots of French Beans. Like your correspondent, "Ca Canny," he is evidently fond of a joke flavoured with sarcasm, when he says that I must have acres of glass to accommodate such a number, unless they were of the smallest size; but I rather understated the number than exaggerated it, for one of my men tells me the number was nearly 400. Anyone who has a pit covered with a dozen lights and heated with hot-water pipes (manure linings answers well for spring work) can easily have 300 pots of 24 and 16-size, if he makes use of such compact-growing and free-fruited kinds as Osborn's, and others which I place side by side on trial. My few remarks were intended to prove that Osborn's was the best of any—indeed, I have seen no French Bean anywhere grown under any system which can surpass this kind as a free bearer, or for compact habit and excellent quality. It was recommended to me a number of years ago by the late Mr. Thomas Osborn, whose word could always be relied on. I bought a packet, planted it out in a brick pit, and was greatly pleased with the crop. I never had the fortune to get it true since till this season, when I secured a quantity from Messrs. Veitch. It may startle Mr. Gilbert when I tell him it was to economise glass that I potted so many French Beans at one time. It is well known that when a Bean is grown out in the open ground, and has all that it requires, it will produce pods for at least four or five weeks in succession, and why should we not expect the same under glass? The kinds referred to have produced abundantly to the end of May, the roots having grown through the pots into the plunging material, and have defied red spider from the amount of nutriment drawn into the plants, thus reducing the labour of watering. Besides growing quantities on the good old established system, practised by Mr. Gilbert so successfully as to get a peck from forty pots at one picking, I plant out many in pits, either from small pots, or as one would plant in the open ground. As the pits can be spared between the crops of early Potatoes, Asparagus, Tomatoes, &c., and late Melons and Cucumbers, a number of French Beans are brought forward in Vineries or elsewhere ready to fill the structure as soon as the other crops are cleared out. The surface soil is removed after the Beans are finished—the Melons or Cucumbers are in large pots, ready to fill the positions where they are to yield their supply. They are often plunged in the pots and allowed to root through into the soil. After they are done with, the pits give shelter to Lettuce; later, French Beans, or bedding plants, till they are prepared for forcing in the early part of the winter. We thus secure at least four crops in one year from the same structure. I think planting out French Beans in the open bed is not practised so generally as it ought to be. I was pleased, the other week, in passing through the gardens at Canford, in Dorsetshire, to observe that Mr. Dick plants out his French Beans in pits, and grows them as simply as Potatoes. By planting out, the returns are greater, red spider is less to be dreaded, and labour is economised.

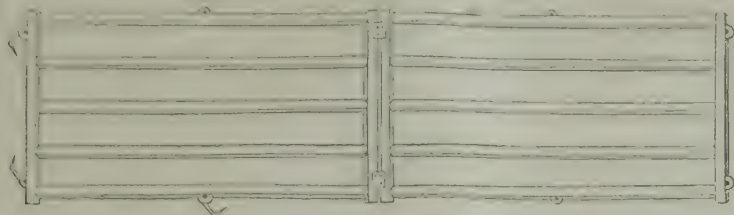
M. TEMPLE.

Blenheim.

STRAW-MAT PROTECTORS.

THE article written by Mr. Williams, of Ormskirk, on the construction of Potato protectors was re-published in America by the "Agriculturist," a widely-circulated periodical, and the mode advocated has been adopted as a great improvement by some of the leading cultivators there, one of whom writes as follows, in reference to the construction of straw mats on the same principle:—"As the mats needed for covering hotbeds, cold-frames, &c., are required to be of a different size from the Lancashire screens, as well as of less thickness and weight, a different frame is necessary. To make this I procured ten strips, each 7½ feet long, 2 inches wide, 1 inch thick, and four pieces of the same material 4½ feet long, for cross pieces. Each end of the long strips was "halved," for half its thickness. Two of the cross-pieces being laid down, five of the long strips were placed, one in the middle, one for each side, and the other two equidistant from the centre and side strips, as in the diagram, and firmly nailed, this made one half the frame; the other half was made in the same way, and the two hinged together at one end as in the drawing. The space between the long slats, when the two parts are shut together, is 1 inch. To keep the frame from springing apart, after being filled with straw, a hook and screw-ring was fastened on each side at the centre, and two on the end. The frame was now finished, and after laying it upon a pair of tressels, it was filled with straw laid cross-wise and evenly, with the butt-ends projecting beyond the frame an inch on each side. The halves, being fastened by means of the hooks, it is set on end and kept in an upright position by

any convenient support, and is ready to be sewed. The needles used are about 5 inches long and half-an-inch thick, and can be made of any light wood, as the mats, being only an inch thick, do not require such strong needles as those described in April. The sewing is done in four places, the stitch being the same as described for the Lanca-



Frame for making straw mats.

shire mats, with the addition of tying each stitch, making a simple tie each time the thread is put through. This tied stitch is very secure, and prevents any slipping of the twine. This differs from the other mats, you will observe, in having the straw laid crosswise and the sewing done lengthwise, as shown in the illustration by the dotted lines. After the sewing is finished the projecting ends of the straw are cut off even with the frame, which may be readily done with a strong sharp knife. For hot-beds the mats are made 7 feet long, in order that there may be 6 inches to hang over at each end; the frames are made 6 inches longer, as so much is lost in the length by the taking up in sewing. Their width, $4\frac{1}{2}$ feet, allows two mats to cover three 3-foot sashes. These mats are light, flexible, and strong, and can be made about twice as quickly as by the old style of weaving them. Two men with a little practice can readily make ten mats in a day; while, according to Mr. Peter Henderson, two men, by the old plan, can only turn out five mats a day."

Potatoes of American Origin.—In consequence of our offering various silver cups and other prizes for American Potatoes this season, an enquiry has arisen amongst intending competitors as to which sorts, of the great number of varieties in cultivation, were of American origin. In order, therefore, that no confusion may exist upon this point, and that no exhibitor may be disqualified by the exhibition of sorts not American, we furnish the following list of Potatoes which have been introduced to this country from America:—Alpha, Eureka, Snowflake, Brownell's Beauty (syn. Vermont Beauty), Extra Early Vermont, Compton's Surprise, Early Gem, Late Rose, King of the Earlies, Climax, Bresee's Peerless, Bresee's Prolific, Early Goodrich, Garnet Chili, Peachblow, Early Rose. The foregoing names stand about in the order of their date of introduction, the newest varieties being first. —HOOPER & Co., Covent Garden.

The New American Potatoes.—Last spring, I purchased one pound of Snowflake and Eureka Potatoes. Of Snowflake, I had three tubers to the pound; but, being small in size, I was rather disappointed with them. I placed them upon a dry warm shelf in the potting-shed, until all the eyes were sprouted. On counting them, I found that thirty-eight eyes had started. After cutting them into sets, I laid them on dry sand for a few days, in order to get rid of the superfluous moisture. After that, on putting the sets into the scales, they were 3 ounces short of a pound weight. I treated the Eureka precisely as I had done the Snowflake, and found it to be 4 ounces short of a pound. The whole of the Snowflakes sets came up beautifully; but, to my disappointment, within the last ten days, more than half of my plants have shown curl in the leaf, which eventually becomes dried and yellow, and finally drops off, leaving the stem bare. The Eureka, growing side by side, exhibits extraordinary vigour. At two places in this neighbourhood, where the Snowflake is grown this season, the same symptoms have occurred—even worse in one case than in mine. Have any of your correspondents, who grow the Snowflake, observed any symptoms of what I have described. —J. T.

Value of a Garden to a Farmer.—I hold it to be a sober fact that the garden is too often neglected—that it does not profit anyone to so neglect it, for among its products are to be found health-inspiring food, increase of comfort, and a higher satisfaction of mind, together with full compensation in material value. Have we need to ask whether these rewards are well worth the seeking? One hour spent in such a garden, each day at the fittest time, would nearly, if not quite, afford all the labour required. The real pleasure derived from seeing the garden luxuriant in growth, without a weed showing its head, would pay over and over again. I regard it as beyond a doubt that the farmer who will make his garden bring forth thus abundantly, and does not permit weeds to check the tender plants, will so learn from the garden as to gather larger and cleaner crops from less grounds.—"Cultivator."

TREES AND SHRUBS.

HARDY AZALEAS.

THESE are now beautifully in flower, and are so fresh and fragrant that they ought to be more generally grown in shrubbery borders than they are. We saw some magnificent masses of them 8 or 10 feet in height in full flower at Belvoir the other day, and Mr. G. F. Wilson has just sent us some charming trusses of flowers of these Azaleas, which are now making a fine display in the rock-garden at Weybridge. The colours are rose, buff, orange, and orange-buff, and when intermixed with tender young foliage it is difficult to imagine anything more beautiful. In every variety of this plant, when grown well in any deep rich soil, intermixed with Rhododendrons, the different tints of yellow, red, and orange, have a pleasing



Ghent Azalea.

effect among the white, rose, and purple tints of the latter plant. Another attraction possessed by these Azaleas is that the foliage becomes bright yellow and crimson in the autumn. B.

Burrs on the Elm.—Last week I saw, when walking through Bersham Park, in the neighbourhood of Wrexham, a large Elm, the upper part of which was destroyed by burrs. At a distance, it had the appearance of a huge stag's horn; and must have borne no fewer than one hundred burrs. It is allowed to remain undisturbed, as the owner of the property considers it rather ornamental than otherwise. Such excrescences, are, I have no doubt, caused by birds picking off the buds in spring, when another set shoots out, which gives rise to an immense number of small branchlets. This effect may also be seen in the peculiar accumulation of twigs which occur, bird-nest-like, in Birch trees; except that, in the case of the Birch, the bark is not composed of the thick suberous layer which is seen in the Elm. The latter always thickens, or swells, when injured; but, in the Birch, its effects are simply to increase the number of small twigs, without the swelling of bark.—J. R.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Abelia triflora.—This is now flowering profusely on an east wall at Kew, each shoot being terminated by a cluster of Bouvardia-like white flowers and delicate rosy buds. It reaches the top of a wall about 10 feet in height, and its flowers are very sweet-scented.—Q.

The Evergreen Honeysuckle (Lonicera semperflorens).—In sheltered positions this is a most useful Honeysuckle. It has opposite waxy-looking leaves and bears clusters of bright orange-scarlet flowers, which may now be seen in great beauty at Kew.—B.

The Monterey Cypress (Cupressus macrocarpa) as a Side-side Plant.—Amongst the numerous varieties of Cypress which we possess, none equal this for planting near the sea. In this locality (Lynne Regis) it flourishes and grows amazingly, and retains its beautiful dark green colour in spring, when many of the allied species are of a rusty brown hue, caused probably from the action of the sea breezes.—H. MUNRO.

Rhododendrons and Kalmias.—I have not seen such a fine display of blooms on hybrid Rhododendrons for four years as there is this season. Here, in the south-west, they are in full flower and uninjured by frost. Kalmias are also covered with flower-buds ready to open, and of these there will be a grand show in another week or two. These grow magnificently on pure sandy loam rather dry, where Andromedas would die.—W. D. C.

Late Leafing of Ash Trees.—My attention has been called to the fact of the Ash trees being very late in getting into full leaf. Even yet (June 7th) many of them are very bare, and none in the state we usually have them at this time of the year. The foliage of Oaks and other trees is good, and has been all along during the spring quite as early as usual, and young trees, notwithstanding the dry spring, are growing rapidly. For some years Ashes have not been thriving well in this district (the south-west of Scotland) and many trees by no means old have died.—W. H. M.

COMPOSITION AND PROPERTIES OF WATER.

By DR. VOELCKER.

LIKE pure and fresh air, good and wholesome water is an indispensable element for maintaining health and contributing to the comforts of life. It has been surmised that waters which have their origin in crowded cities or in their immediate neighbourhood, must contain ingredients incompatible with their use as a beverage or for general domestic purposes. The sudden outbreak of cholera, and the prevalence of typhoid fever and other infectious diseases in certain localities, have long been associated in the popular mind with bad water and impure air; and there can be no doubt of the great influence which the purity of air and water exerts on general health. An examination of a large number of samples of water both from towns and from the country leads me to the conclusion that towns, as a rule, are supplied with pure drinking water and water better suited for general household purposes than country districts, where the water supply is often not only deficient in quantity, but frequently largely impregnated with sewage and yard and house drainage, thus rendering it unwholesome and unfit for drinking purposes. There are many villages with no other source of supply than shallow wells; and even the country residences of the nobility and landed proprietors I find frequently are supplied with unwholesome water, or water much less pure than that in use in most towns. The purity and suitability for general household purposes of spring, river, and well waters, in the first place, are influenced by the chemical composition of the rocks of the locality in which they originate; and in the second place the properties of natural waters are more or less affected by local sources of contamination, such as the proximity of the well to a cesspool, a house or yard drain, a stable yard, or a dung pit. If a water emits a strongly disagreeable smell, or if it is more or less coloured yellow, or if it is turbid, or if it shows flocculent, floating particles of organic matter or living organisms, no chemical examination is requisite to prove its unwholesome character and unfitness for drinking purposes. It, however, frequently happens that fairly bright and barely coloured water, emitting no smell whatever, nevertheless may be impregnated with an amount of organic impurities and certain saline ingredients which will render it unfit for drinking and cooking purposes. By a careful chemical and physical examination it may be decided without much difficulty, in many cases, whether or not water is fit for drinking, and which of a number of samples is best adapted for general domestic purposes. In other instances the analytical indications are less decisive, and the water will have to be pronounced of a suspicious or doubtful, or, at all events, not perfectly wholesome character. The principal varieties of natural water are rain, spring, river, and well water. These may be conveniently placed in two groups, and described as soft and hard waters. There is, however, no distinct line of demarcation separating the two groups, for the difference between hard and soft water is one of degree and not of kind. Speaking generally, a water is called soft if it contains per imperial gallon not more than 12 or 15 grains of fixed constituents, the greater part of which consists of carbonate and sulphate of lime and magnesia. If there are more than 8 or 10 grains of lime and magnesia compounds in the total fixed residue, and the amount does not exceed 16 grains, the water is said to be moderately hard; and if the earthy matters exceed 16 grains in the gallon it is considered decidedly hard.

Soft Water.

In Nature, water is never found perfectly pure. The impurity of the water is frequently visible to the eye. Fine suspended red clay often imparts a reddish colour to rivers flowing through rocks of red marl, which contain much oxide of iron in their composition; occasionally it appears milky, from fine particles of white clay, which settle with difficulty or only imperfectly after long subsidence. In other instances, river water is contaminated with town-sewage, and then appears muddy and more or less dark-coloured. It is generally brown where it issues from boggy lakes or passes across a peaty country, and in that case seldom is perfectly clear and colourless. Besides the visible impurities taken up from the rocky and other materials which water meets with in and upon the earth, there are others which are held in solution, the presence of which cannot be detected by the sense of sight. The brightest, clearest, and perfectly colourless spring and river waters are never chemically pure; they all contain in solution a greater or less quantity of saline matter and earthy constituents, which are left behind as a fixed residue when the water is evaporated to dryness. The water which descends as rain, having undergone a species of natural distillation, is, if collected in clean vessels and in the open country, the purest and softest of all natural waters. On evaporation to dryness it scarcely leaves any fixed residue. It is contaminated only with exceedingly small quantities of carbonic and nitric acid and ammonia, and light floating particles of impurities washed by it out of the air during its

descent. Rain-water collected in towns or smoky localities, such as manufacturing or coal mining districts, contains, in addition to the traces of atmospheric impurities just named, soot and other mechanical impurities, or constituents dissolved from the materials of the roofs of the building upon which the rain falls. Rain-water collected in towns is always more or less dirty from suspended or mechanical impurities, and generally more or less yellow-coloured by soluble organic matter. In a filtered state rain water is the softest natural water, and most useful for washing purposes or for the feeding of steam boilers. It absolutely prevents boiler incrustations, which cause so much inconvenience, when hard waters, largely impregnated with lime-salts, have to be used in kitchen boilers and steam generators. Rain water, however, is insipid and wanting in the peculiar refreshing taste so much prized in fresh and bright spring-water. On keeping, moreover, the organic impurities enter into decomposition and impart a disagreeable smell to it, which can only be effectually removed by filtration through a charcoal filter. In view of the great advantage of having the command of soft water for washing purposes, arrangements should be made in every country house for the collection of rain in suitable reservoirs. The rain-water may be gathered in water-tight cemented brick-tanks, or it may be stored conveniently in wooden tanks or a number of large barrels. But it should not be kept in tanks lined with sheet-lead, which would be rapidly corroded; and as this poisonous metal passes into actual solution in the shape of oxide of lead, rain-water collected in such tanks should on no account be used for drinking purposes. Amongst the purest natural waters hitherto examined are the waters of several lakes in the north of Scotland and of Cumberland. These waters contain only a small proportion of solid matter per gallon; they are very soft in consequence, and excellent for washing purposes. At certain times of the year they get coloured by peaty matters, which, besides rendering them rather unsightly, give them an unpleasant taste. The waters of Loch Katrine, which furnishes Glasgow with a copious supply of excellent water, has been repeatedly analysed, at all periods of the year, by different chemists, and has been found exceedingly soft and good for general household purposes. These waters are bright and pure, and entirely unexceptionable in point of aëration and colour. Their usual temperature when taken up was from 50° to 52°, showing that their sources are deep-seated and that they preserve the average temperature of the whole year. Their taste betrays no organic taint, but evince great purity, although they appear rather flavourless and somewhat rapid to persons habituated to the use of hard waters. Wells sunk in deep sandy soils or in silicious rocks generally furnish soft waters. Although soft water is greatly preferable to hard for washing or cooking purposes, or for supplying steam boilers, it frequently happens that soft spring and lake waters, especially when much charged with carbonic acid and well aërated, exert a corrosive action upon lead, and become contaminated with soluble lead compounds. It is true that the amount of oxide of lead dissolved by the action of soft waters upon leaden pipes or the sheet-lead linings of water tanks, rarely amounts to more than one part or less in ten millions of the fluid; but, although such small quantities of lead probably will not do any positive injury to persons who take the water habitually, even traces of lead are undesirable in potable waters. Most waters which corrode lead usually act more or less energetically upon metallic iron. The storage of soft water in iron tanks, and its conveyance through iron pipes are frequently attended with inconvenience, for the hydrated oxide of iron, produced by the action of the water upon iron, gives a reddish-brown colour to the water, and renders it muddy to an extent which entirely prevents its use for household purposes. With a view to preventing the corrosive action of soft water upon iron, it has been recommended to substitute galvanised iron for plain cast or sheet iron. I find, however, that galvanised iron is not an efficient protection against the corrosive action of water; and instances have been brought under my notice in which tanks made of galvanised iron were attacked more rapidly than plain cast iron tanks. In galvanising iron it is difficult, if not practically impossible, to cover the surface of the iron with metallic zinc so completely as not to leave here and there small particles of iron of a rough surface unprotected by zinc; and it appears to me that a true galvanic action is set up by the water in contact with the two metals—iron and zinc forming a galvanic pair—in virtue of which action the iron is more rapidly corroded than in the case of ungalvanised iron tanks.

Hard Water.

That springs rising in granitic regions, or in localities where primitive rocks, little acted upon by water, prevail, or which have their origin in siliceous strata, furnish soft water, we have seen. On the other hand, springs which rise in the oolite or chalk formation, and all waters which flow over calcareous rocks, or pass through soils abounding in lime, are always more or less largely impregnated

with carbonate and sulphate of lime and magnesia. It is chiefly to the lime and magnesia, in combination with carbon or sulphuric acid, that what are called hard waters owe their property of curdling soap. Perfectly pure or soft water, in contact with chalk or limestones (carbonate of lime) is capable of dissolving only a very minute quantity of these materials; one gallon of water taking up no more than 2 grains of carbonate of lime. This earthy impregnation is said to give the water 2° of hardness. Most natural waters, however, contain more or less carbonic acid gas, which is a good solvent of carbonate of lime, forming with it soluble bicarbonate of lime. Spring waters in the chalk formation often contain as much as 16, or even 20 grains and upwards, of carbonate of lime in the gallon. Such waters are generally bright and sparkling to the eye, and agreeably sweet to the taste. When boiled they become milky, and leave a sediment which incrusts the insides of kettles and boilers. The explanation of the change which hard waters undergo on boiling is found in the fact that the second equivalent of carbonic acid in the soluble bicarbonate of lime is only loosely united with carbonate of lime. At the ordinary average temperature of the air, hard water contains bicarbonate of lime in a state of perfect solution, but on raising the temperature to the boiling-point of water the carbonic acid, which holds the carbonate of lime in solution, is driven off, and insoluble carbonate of lime is then precipitated, as a sediment, in consequence, with the exception of the two grains which are held in solution by the water itself. The carbonate of lime, dissolved by carbonic acid and curable by boiling the water, expresses its temporary hardness. An artificially prepared hard water, containing 13½ grains of carbonate of lime to the gallon, was observed to decrease from 13·5° to 11·2° of hardness merely by heating it in a kettle to the boiling-point. Boiling for five minutes reduced the hardness to 6·3°, fifteen minutes to 4·4°, thirty minutes to 2·6°, and one hour to 2·4°. The softening effect of boiling does not therefore appear all at once, but the greatest proportional effect is certainly produced by the first five minutes' boiling. In addition to carbonate of lime, hard waters generally contain sulphate of lime and not unfrequently nitrate of lime, and occasionally chloride of calcium. These salts of lime are dissolved in water without the intervention of carbonic acid gas, and therefore remain in solution although the water is boiled, and impart to it permanent hardness. Soft water readily produces a lather with soap; hard water, on the other hand, destroys much soap before a lather is formed. Soap may be regarded as a soluble compound of soda with fatty acids. With lime these fatty acids form insoluble compounds, and hence it is that hard waters are deprived of lime or softened at the expense of soap. The carbonate of lime in water decomposes about ten times its weight of soap in washing, and other salts of lime act injuriously upon soap in proportion to the lime they contain. Carbonate of magnesia and other salts of magnesia act upon a solution of soap in a similar manner to lime salts. On adding a solution of soap to hard water white curdy precipitates are produced, and no lather appears until the lime and magnesia in the water are completely thrown down by the soap solution. The production of lather by the addition of measured quantities of soap solution of a known strength thus affords a good indication of the degree of the hardness of a water. Each degree of hardness indicates 1 grain of carbonate of lime or its equivalent of other soap-destroying earthy compounds, in an imperial gallon of water. The quality of the water supply as regards hardness varies greatly in different towns. The waters supplied by the Metropolitan Water Companies contain from 19 to 24 grains of solid constituents in the gallon, and vary in hardness from 14 to 15 degrees. As an example of a moderately hard water, the water supplied by the New River Company may be quoted. An imperial gallon of this water contains:

	Grains.
Earthy carbonates	12·58
Sulphate of lime	2·41
Chloride of sodium	1·28
Nitrate of magnesia	2·08
Silica and oxide of iron and alumina	·38
Oxidisable organic matter	·32
Total solid constituents per gallon	19·05
Degrees of hardness before boiling	14·4°
„ „ after boiling	4·2°

The water further contains per gallon:

Actual or saline ammonia	·001
Organic or albuminoid ammonia	·003

Wells sunk in the chalk formation usually furnish bright, sparkling, perfectly colourless, and excellent drinking waters, remarkable for their absence of organic impurities. Deep chalk springs, or artesian well waters, however, are generally hard, and not so well adapted for washing or cooking as for drinking purposes. Deep chalk well water generally has a uniform temperature through-

out the year of 50° to 52° Fahr., and thus possesses a desirable coolness which recommends it for drinking purposes. The only and obvious objection to chalk spring water is its hardness, which, when the water is first drawn, is generally from 16° to nearly 18°. A portion of the carbonate of lime, which occasions the hardness, is deposited from the water, when exposed to the atmosphere, with facility, from the escape of carbonic acid gas, and thus by simple storage in reservoirs or tanks for a few days the water becomes much softer. When hard waters are used in steam boilers they rapidly produce a stone-like incrustation or fur, which interferes with the economic generation of steam; and, if not removed from time to time, may become the cause of boiler explosions. Spring and well waters, in districts where Lias clay, Wealden, or Oxford clay abound, are sometimes charged with so much saline matter as to give them a decided mineral taste and to impart medicinal properties to them. A spring of that character occurs in a clay bed at Parton, near Swindon. This spring is used, with considerable benefit, as a remedy for a variety of disorders; and, in addition to the usual constituents of mild saline waters, such as sulphate of soda (Glauber salt), sulphate of magnesia (Epsom salt), and chloride of sodium, the water contains a considerable amount of carbonate of potash, and appreciable proportions of iodide of sodium and bromide of magnesium, which constituents do not occur in ordinary potable waters, and to which, no doubt, its medicinal virtue is partly owing. The alkaline carbonate gives it a strong alkaline reaction.

The best Water for Household Purposes.

The properties which are esteemed of most value in water for drinking and general domestic purposes are:—1. Freedom from putrescible organic matter. 2. Freedom from constant, or even occasional, discolouration by clay and vegetable matter, with perfect brightness and clearness. 3. Freedom from smell and disagreeable taste. 4. Softness. 5. Coolness. Water suitable for all domestic purposes should not contain an excess of saline and earthy matters, and, generally speaking, not more than about 25 grains of solid substances in the imperial gallon. The less lime and magnesia salts it contains the better it is for washing, or cooking, or the generation of steam in boilers. A moderate amount of mineral matter, or even a sufficient amount of earthy carbonates to render water decidedly hard, does not interfere with its use as a beverage, for it may be safely stated that no sufficient grounds exist for believing that the mineral contents of ordinary hard spring-waters are injurious to health. The amount of lime and magnesian salts in chalk-springs, and in waters having their origin in calcareous strata, must be greatly exceeded in general by the quantity of the same salts which enters the system in solid food; and it is a notorious fact that chalk-springs, which seldom contain less than 15 or 16 grains of carbonate of lime, are universally considered to furnish perfectly wholesome, and indeed the choicest drinking water. It is true that chalk-springs are wanting in softness, one of the properties most valued in water; but, on the other hand, the uniform coolness of the water at all periods of the year, its perfect brightness and clearness, freedom from smell or disagreeable taste, and especially its perfect freedom from organic matter capable of further alteration or decomposition, recommend it as an excellent drinking water. In point of softness, the springs in granitic regions, or districts in which primitive rocks prevail, are superior to chalk springs; but, unfortunately, very soft waters are frequently coloured by organic matter, and, as a rule, act upon leaden pipes more energetically, and are more liable to become contaminated with soluble compounds of lead, than hard waters; and this circumstance presents certain disadvantages to the use of very soft waters, such as those from the Cumberland or Scottish lakes. Wholesome and perfectly unobjectionable waters are always bright and free from colour. If a water has a yellowish colour, and at the same time a more or less nauseous taste or smell, no chemical analysis is required to prove its unfitness as a beverage; for such water is certain to contain decomposing organic matter of animal origin, which cannot fail to be a source of serious danger to the health of those who drink it habitually. Light floating particles of suspended organic matter also frequently afford indications of the unwholesome character of water. It is well, therefore, to submit water to a preliminary examination, upon the results of which it will depend whether it is desirable to incur the expense of a thorough chemical analysis. In the first place, I would ascertain whether the water is colourless, or more or less tinged yellow. This may be done by filling a glass tube, 2 feet long and about 1½ inches wide, with the water, placing the tube upon a sheet of white paper, and comparing the colour of the water as seen when looked through the whole length of the tube with the colour of pure distilled water contained in a tube of the same length and diameter. Or the colour may be noted by filling a white Bohemian glass flask, holding about a quart, and placing it on a sheet of white paper, and placing by its side a flask of the same size, filled

with pure distilled water. The best drinking water appears as colourless as pure distilled water. Most river waters show a greenish tint; and peaty waters and waters contaminated with yard drainage or sewage, often appear more or less yellow coloured. By the same experiment the presence of any small floating particles may be readily detected in the water, when the flask is held in front of a dark coloured wall, a strong light falling on the flask from one side or from above. Should the water contain much suspended matter, set the flask aside for a couple of days, and then pour off the clear liquid, or pass it through filtering paper, and examine the colour of the clear or filtered water as before. The suspended matter may be fine clay or marl, and simple filtration or subsidence may render it quite fit for use. In the next place it should be ascertained whether the water has any smell. If it contains appreciable quantities of sewage or decomposing organic matter, it will necessarily have a bad smell; if there are but small quantities of such matters present it is often difficult to decide at once whether the water is free from smell or not, and in that case it is best to fill a large flask or bottle with water, to pour out the greater part of the contents, and then to inhale the air in the partially filled flask or bottle. In this way, and especially if the flask is gently warmed, may be detected a disagreeable smell, which cannot be clearly discerned by the ordinary mode of noticing the smell of water. Another preliminary examination, which anyone may make, is to fill a clean wine bottle quite full with water, cork it down tight, and set it aside for about a week; then draw the cork and notice whether the water gives off a bad smell, or has in any other way undergone a change. At the same time place some water in an open vessel—best a clean glass beaker—cover it over loosely with filtering paper to exclude dust and similar mechanical impurities floating in the air, place the water aside for a week or fortnight, and observe from time to time whether the water remained fairly clear, or whether fungoid growth or the development of plants of the lowest order has taken place. In waters contaminated with even small quantities of sewage the development of vegetable cells and plants of the lowest order is very striking. Lastly, evaporate about one pint of water in a clean small porcelain dish or, better still, platinum capsule; and notice whether the water remains unaltered as regards colour, or whether it turns yellow or brownish on concentration to a small bulk. If a water contains merely traces of organic matter it does not sensibly turn colour on concentration; but, if it is contaminated with an appreciable amount of organic impurities, it turns yellow or brown. Evaporate the water under examination completely to dryness, and notice the colour of the residue. If quite white, like the residue obtained by evaporating to dryness the colourless water of chalk springs, no organic matter is present; but, if the residue is coloured yellow, as is the case with most natural waters, a certain amount of organic matter is present. The organic matter may be harmless, or it may be injurious to health, and in that case requires further examination, which should be entrusted to an experienced and skilled analyst. A good idea of the general character of the organic matter in water may often be formed by noticing the smell which is given off when the residue obtained by evaporating one pint of water is heated over a spirit or gas flame in the dish in which it was obtained, allowing the air free access. Vegetable or peaty matter manifests itself on heating by its peculiar smell; and, moreover, the fumes which are given off, when tested with moistened litmus paper, show a slight acid reaction. Animal organic matter, on the other hand, on heating produces fumes which turn reddened litmus paper blue, and thus have an alkaline reaction; the vapours which are generated when animal organic impurities are exposed to a strong heat possesses the peculiar smell of burned or singed hair or feathers, which characterises all nitrogenous organic matters.

Impurities in Water.

As stated already, in forming an opinion of the sanitary quality of a water, or the merits of a number of samples of potable waters, particular care should be bestowed on the examination of the amount and character of the organic impurities which the water may contain. In towns, no less than in the country, shallow well waters are liable to become contaminated with drainage products containing soluble organic impurities of the most injurious kind to health. In sinking a well, the close proximity of a farm-yard or stable-yard, a cesspool or drain conveying house-slops or sewage, or the neighbourhood of a cemetery, or the depositing place for town rubbish, and all localities where organic filth accumulates, should be avoided as much as possible; and care should be taken to prevent the infiltration of surface water into the well, and by making it water-tight, to exclude percolation from drains near or at some distance from the well. The wells in crowded cities, or the pumps in the close neighbourhood of burial places, are frequently contaminated with organic impurities of the most objectionable character, and are a frequent cause of the outbreak and spread of infectious diseases. Such waters at certain

times of the year are quite bright, free from smell, and scarcely coloured; and their physical properties thus afford no clear indication of anything being wrong with water. At others they give off a disagreeable smell, and appear decidedly coloured yellow. Well waters which do not show a uniform character as regards freedom from smell and taste ought not to be used for drinking purposes. The simultaneous occurrence in water of much common salt, nitrates of lime and magnesia, of much saline and organic ammonia, and of oxidisable organic matter, is an unmistakable proof of the presence of sewage or drainage products. Ordinary spring and wholesome well waters never contain more than mere traces of phosphate of lime; and, according to my experience, phosphates are only found in appreciable proportions in waters highly charged with sewage, or products resulting from the decomposition of animal organic matter. Very soft waters, as mentioned already, not unfrequently contain traces of lead in solution. It may be questioned whether minute traces of oxide of lead exert a positively injurious effect upon health, but there can be no doubt that an appreciable quantity of soluble lead compounds in water affects injuriously the health of man and beast. A remarkable instance of water contaminated with an unusually large proportion of oxide of lead was brought under my notice some years ago. This water on examination was found to contain in the imperial gallon:

	Grains.
Organic matter	5.22
Oxide of iron20
Oxide of lead47
Sulphate of lime	3.14
Carbonate of lime	1.31
Magnesia	1.28
Chloride of sodium	2.30
Alkaline nitrates	2.38
Soluble silica	1.05

Total solid matter (dried at 130° C.) per gallon 17.35

It will be seen that this water contained nearly half a grain of oxide of lead in the gallon; and I ascertained that this poisonous oxide occurred in solution partly as bicarbonate of lead, partly as nitrate of lead. The water was drawn from the leaden supply-pipes connected with a well sunk in close proximity to a manure-heap, which accounts for the abnormally large quantity of soluble organic matter in the water. Drainage from the dung-heap evidently passed into the soft well-water, partly in an unaltered condition, partly oxidised into nitrates, which, in contact with metallic lead, are known to give rise to soluble nitrate of lead. Probably the soluble organic impurities in the water also acted upon the lead and gave rise to soluble lead-compounds. The unfavourable position of the well in this case fully accounts for the contamination of the water with injurious organic impurities, and the still more poisonous lead compounds. The properties of water, which enable it to act at times with unusual vigour upon lead, are little understood, and seem often to arise from the accidental action of local causes, such as the presence of drainings from dung-heaps and decaying organic impurities. These causes are of a kind most to be dreaded in the supply of a single residence, in which, as in the case before us, the whole volume of water may at a time assume the same dangerous composition. The facility with which nitrogenous organic matters are oxidised in porous soils and converted into nitrates adds to the danger of water becoming impregnated with poisonous soluble compounds of lead; for, according to the uniform experience of all chemists who have studied the action of the different constituents of natural waters, no saline matter corrodes lead so readily as nitrates. Most soft waters act more or less energetically upon lead when they are well aerated and impregnated with atmospheric oxygen, which appears to be a primary cause of the action of soft water upon lead, for pure, distilled, or rain water, purposely deprived of air, does not attack lead in any appreciable degree. This explains why some soft waters in contact with lead become impregnated with this poisonous metal, whilst others scarcely attack lead, and may with safety be conveyed through leaden delivering pipes. Hard waters, as a rule, do not act upon lead so readily as soft, especially if they contain carbonate of lime dissolved in carbonic acid gas. The effect of this compound is fortunately to neutralise to an extraordinary degree the usual solvent action on lead which water exercises through the agency of the oxygen dissolved in it. The soluble oxide of lead is converted into carbonate, which, although not absolutely insoluble, appears to be the least soluble of all the salts of lead. Carbonic acid is usually present in moderately hard spring, river, and well waters, and also in most soft natural waters, in sufficient quantity to prevent the solution of a dangerous amount of lead. On the other hand, certain salts, especially sulphates, to which a protecting effect is usually ascribed, do not appear to exercise uniformly that useful property. Hard waters containing an abundance of so-called protecting salts, sometimes corrode lead with remarkable rapidity, but, fortunately, no lead

passes into solution, for the carbonate of lead resulting from this corrosive action is wholly insoluble, even in water highly charged with carbonic acid gas. Even excessively hard waters sometimes rapidly corrode leaden pipes, especially if they have an alkaline reaction. I have in my collection pieces of originally stout leaden pipes, which in the course of less than twelve months were eaten away to a layer as thin as writing paper, surrounded by a thick hard coating of carbonate of lead. Although carbonate of lead cannot pass into solution this dangerous lead compound may be present in water in a suspended state, and in that condition may be mechanically introduced to the system. The practice of filtering water kept in leaden cisterns and intended for drinking purposes cannot, therefore, be too strongly recommended.

Purification of Water.

Spring, river, well, or lake-waters, as it has been shown, are rendered impure to a greater or less extent—1. By suspended animal and organic substances, such as finely-divided clay, marl, flaky organic matters, decaying vegetable matter, and similar mechanical impurities: 2. By soluble organic impurities, which generally colour the water yellow or brownish: and 3. By certain saline matters and soluble earthy compounds, which, in the shape of a more or less considerable and generally slightly coloured residue, are left behind when a measured quantity of any kind of natural water is evaporated to dryness. In other words, suspended—or mechanical, organic, and mineral,—and soluble—vegetable, and animal,—matters, are the ordinary impurities of natural waters, to which have to be added, in exceptional cases, sulphuretted hydrogen, traces of copper, arsenic, or more frequently lead. The means available for the purification of water are:—1. Distillation. 2. Filtration. 3. Precipitative processes, which remove certain soluble earthy compounds.

1. Distillation.—When river, or spring, or sea-water, is kept boiling in a glass retort or metal still, it is converted into steam, which carries with it all the gaseous or volatile impurities that may have been in the natural water, and leaves the whole of the solid saline and earthy matter behind. By suitable cooling apparatus the steam is readily condensed; and if the first part of the distillate, containing most of the volatile impurities, is rejected, nearly pure distilled water is obtained. Except at sea, or for chemical use, this method of purification is seldom resorted to for effecting the purification of water.

2. Filtration.—On a large scale, turbid river-water is effectually clarified by passing it through gravel and sand filter-beds. By this means the mechanical impurities, such as fine clay or marl, dead leaves, and similar accidental impurities, are arrested in the filter-beds, and the water is rendered bright. Filtration through sand also removes to some extent soluble organic matters, which sometimes give a yellowish tint to river-waters, for by passing through gravel or sand, a portion of such organic matters is oxidised, and the filtered water is in a measure deprived of the original yellow tint. The saline and earthy matters dissolved in water, however, are not diminished by sand filtration, or only in a very slight degree. The necessity for this process may be greatly diminished by the use of subsiding reservoirs, which, moreover, have the advantage of exposing the remaining water for a length of time to the oxidising influence of atmospheric oxygen, whereby it is deprived of some objectionable colouring matter. But filtration cannot be entirely superseded, being indispensable as the concluding operation of purification, to remove accidental impurities which may find access to the water, as well as fine particles of clay after remaining for a long time in suspension. For household purposes, turbid and slightly-coloured water may be made bright and almost colourless by the use of the tank or hand filters, which are now supplied in all sizes by the London Water Purifying Company, by Messrs. Atkins, Fleet Street; Mr. Lipscombe, Temple Bar; and other makers of water filters. In most of the tank and hand filters advantage is taken of the well-known property of animal charcoal to remove colouring matter. Vegetable or animal charcoal, moreover, retains effectually every trace of lead which a water may contain, either in solution or in a suspended state, and thus tank or hand filters, in which charcoal is employed as a purifying agent, afford the greatest security against danger arising from the presence of lead poison. In Spencer's Magnetic Carbide Filter, the purifying agent employed is magnetic oxide of iron mixed with carbon. Mr. Thomas Spencer prepares this material by using Cumberland hematite iron ore with a certain proportion of carbon and heating the mixture to a dull red heat in retorts for twenty-four hours. The porous magnetic oxide produced is mixed with coarse sand when used for filtering water, and it effectually removes all organic impurities in a state of putrescence, and any traces of lead that may be present. The most recent invention in water filters has been made by Professor Bischoff, who employs spongy iron as a purifying agent. Bischoff

has experimentally investigated the properties of spongy iron, and, amongst other particulars, found that the organic nitrogen and albuminoid ammonia in water are always much reduced in quantity by filtration through spongy iron, which also diminishes the amount of organic carbon. Filtration through spongy iron thus appears capable of decomposing organic matter. It further removes entirely every trace of lead, and, consequently, is a valuable purifying agent for water. Domestic water filters, on Professor Bischoff's plan, are made by Messrs. Murray & Co., of the Caledonian Pottery, Rutherglen. The spongy iron through which the water is filtered is contained in a stoneware vessel, with a slightly curved bottom. On the top of the bottom is a perforated disc, on which the spongy iron is placed. An opening in the curved bottom is connected with an earthenware pipe, which passes up to the outer side of the vessel to slightly above the level of the spongy iron. Here the pipe communicates with another pipe, passing from the top of the outside of the spongy iron vessel down to the centre of the closed bottom. The latter pipe is open at the top and bottom. An alternate exposure to air and water causes the spongy iron to become oxydised, when it loses more or less of its purifying power. A screw-tap at the lower end of the latter pipe serves to regulate the flow of water through the spongy iron. The spongy iron vessel is placed inside the casing of an ordinary stoneware filter, with perforated bottom, beneath which there is a reservoir for the filtered water. On the top of the perforated bottom is placed a layer, some 4 inches thick, of finely-divided marble or limestone, upon which the water containing some iron in solution flows from the screw-tap. The effect of the limestones is to remove completely every trace of iron from the water. Bischoff's filter has a decided advantage over ordinary water-filters, which soon lose their purifying properties unless the filtering agent is renewed from time to time, whereas Bischoff's filter remains in good working order for years, without requiring the renewal of the spongy iron.

3. Purification of Water by Precipitating Processes.—

An elegant and useful process for softening hard water is that patented by the late Dr. Clark, of Aberdeen. Carbonate of lime is scarcely soluble in pure distilled water, a gallon being capable of holding only about 2 grains in solution. In river or spring-water, however, carbonate of lime is held in solution by carbonic acid, or, in other words, exists as bicarbonate of lime. On boiling, the second equivalent of carbonic acid in the soluble bicarbonate is expelled, and neutral carbonate of lime precipitated. Professor Clark proposed to soften hard water by taking advantage of the property of caustic lime to remove carbonic acid from water. Caustic lime, when added to hard water in sufficient quantity, neutralises the carbonic acid, removes the solvent, and, becoming at the same time carbonate of lime, is precipitated with that originally in solution. In falling down, the precipitated carbonate of lime carries with it a portion of the organic and colouring matter present in most waters, and thus Clark's process not only softens but, in a measure, also deprives hard water of organic impurities. Clark's process is peculiarly well adapted to the softening of chalk springs, which owe their hardness almost entirely to carbonate and not to sulphate of lime, a constituent which cannot be removed by heating as by the lime process, and which renders water permanently hard. The composition of spring or well water from the chalk strata varies but little in different localities. Its hardness rarely exceeds 18°, and pretty uniformly amounts to from 16° to 17½°. Water of that degree of hardness contains in 400 gallons about 1 lb. of carbonate of lime, held in solution by 7 ozs. of carbonic acid gas—1 lb. of carbonate of lime, in round numbers, consisting of 9 ozs. of caustic lime and 7 ozs. of carbonic acid. It is evident, therefore, that the addition of 9 ozs. of caustic or quicklime to 400 gallons of such water will have the effect of depriving it of the 7 ozs. of carbonic acid gas, which holds 1 lb. of carbonate of lime in solution; and that both the lime added and that originally present must be precipitated together as neutral insoluble carbonate of lime, minus a small quantity, amounting to about 2 grains in the gallon, which pure water is capable of dissolving. The original hardness of chalk springs may thus readily be reduced by Clark's lime process from 16° to 18° to from 2° to 4°. This process is sufficiently simple to be left to the execution of a workman of ordinary intelligence. All that is required for him to do is to stir lime water or milk of lime, made by mixing quicklime with water—about 1 lb. to 40 gallons of water—into the water intended to be softened, until the carbonic acid which holds the carbonate of lime in solution is completely neutralised by the addition of quicklime. The spring water, on the addition of the lime water, at first has the appearance of thin milk, but the precipitation of the carbonate of lime proceeds with rapidity, and in the course of twenty-four hours the water may be syphoned off from the precipitate and received in a perfectly clear condition into the supply cistern or tank. The only precaution necessary to be taken is to ensure the absence of an

excess of lime. To this end the water in the settling tank has to be tested from time to time with a few drops of a weak solution of nitrate of silver. This test gives a white precipitate in the original hard spring water, and shows whether the quantity of lime required has been exceeded by the brown colour of the precipitate then formed. In practice the addition of lime water is stopped as soon as a sample of the filtered water from the settling tank gives a brownish coloured precipitate with the nitrate of silver test. In that case more of the hard water is added and well mixed with the contents of the settling tank. After subsidence a sample of the softened water is again tested with a drop or two of a nitrate of silver solution, and the addition of more hard water if necessary is repeated a third time, or until the water ceases to give a brown colour, and yields a white-coloured precipitate with nitrate of silver. Clark's process has been tried on a large scale, and it is in successful operation in many dye works and other manufactories where large quantities of soft water are required. The water used by railway companies for feeding their engines is also softened in several places by this useful and extremely simple process; and by it the Water Works Company, at Caterham, has for some years past rendered hard chalk spring water deliciously soft and pure before delivering it to the inhabitants of Caterham. The only drawback in working this process on an extensive scale is the difficulty of finding space for precipitating reservoirs, and storing for an additional twenty-four hours, the immense volume of water which is required for the supply of large cities. However, this difficulty after all resolves itself into a question of expense, which is of no account in the case of private houses, in which Clark's process can be carried out very well without much difficulty.

Boiler Incrustations.

Ordinary boiler incrustations, resulting from the use of hard water, consist chiefly of carbonate and sulphate of lime, as will be seen by the following analysis of a sample which I examined some time ago:

COMPOSITION OF A BOILER INCRUSTATION.

	Dried at 212°.
	Grains.
Water of combination	459
Oxide of iron	53
Phosphoric acid	58
Carbonate of lime	71.06
Sulphate of lime	12.75
Lime in a state of silicate	1.56
Magnesia in a state of silicate	3.23
Soluble silica	5.70
	100.00

Carbonate of lime separates gradually from hard water when the temperature is raised to the boiling-point, and in the course of time assumes a crystalline form. Hard crystalline masses or stone-like deposits are thus formed in steam-boilers, which greatly interfere with the economical production of steam. The best plan of preventing the formation of boiler deposits like the sample, the analysis of which has been given, is to soften the water by Clark's lime-process. The next best plan, in my judgment, is to add to the water a solution of caustic soda; to allow the precipitate to settle, and to use the clear water for feeding the boiler. Or if it be considered too much trouble to soften the water in this way, caustic soda dissolved in water may be put into the steam boiler. By this means the precipitation of carbonate of lime, as well as the removal of lime from sulphate is effected in a condition in which the lime to precipitate is far less crystalline than it is when no precipitating agent is employed. The formation of crystalline and hard incrustations in boilers may also be prevented to a great extent by placing in the boiler Potato peelings, spent tan, peat mould, coarse sawdust, or chips of Oak wood and bark, of similar materials, which act in a purely mechanical manner in preventing the agglomeration of crystalline particles of carbonate of lime into hard masses. Several compositions sold as preventives of boiler incrustations act mainly in a mechanical way, and others in part chemically and in part mechanically. A favourite composition, sold under various names, consists of a combination of crude tannic acid, produced from gum catechu or Oak bark, or other astringent raw materials, from bone-gelatine or glue. Crude tannic acid and caustic soda are likewise constituents of several fluids recommended as preventives of boiler deposits.—“Journal of the Royal Agricultural Society.”

THE gardener who hung an old coat out to frighten birds away and afterwards found a young brood in one of the pockets, writes to us asking for another remedy.

THE JEANNEL FERTILISER.

DR. JEANNEL, inspector of pharmaceutics, came forward, at the sitting of the 25th of March of the Central Horticultural Society of France, to explain the use of his fertiliser, and to answer all questions put to him on the subject. He produced a number of plants cultivated, under his direction, by M. Rivière, of the Luxembourg, half of them watered with the fertiliser and half with plain water, for plants of the same kind, age and size alike at the starting point. There were *Billbergia*, *Dracæna*, *Aspidistra*, *Curculigo*, and others which I do not remember—in all about thirty. The difference was wonderful. Their size and luxuriance were twice, three times, even four times greater with the fertiliser than with plain water. His recipe or formula is based on the analysis of the ashes of a vast number of ornamental plants, on that of the component parts of such manures as are usually employed for their culture, and on that of the soils in which they are habitually cultivated in pots. He has taken the mean (or medium) of all these carefully-made analyses (as it would have been difficult, and almost useless, to take a particular one for each individual kind), and from the whole has composed a formula, which has answered, and even exceeded, his expectations. The kinds of plants most benefited by it are almost all the herbaceous and soft-wooded plants cultivated for ornament. From my own experience with *Pelargoniums*, and some other bedding plants, *Aspidistra*, and several other greenhouse ones, and from what I have seen in the culture of others, notably in *Begonias*, I can only call it marvellous. *Begonia Rex*, in pots of 10 centimètres, have leaves full as large, luxuriant, and numerous as those in pots ten times the size cultivated in the usual way. This mineral manure not only fertilises the soil usually employed in pot culture, but can actually take the place of it, as plants treated with it can be grown in pure sand. The fertiliser has no smell, is perfectly clean, the volume used is incredibly small, and plants may be kept almost indefinitely in the same pots without shifting; therefore, for lady gardeners, window and room horticulture, it is invaluable. The danger of over-dosing the plant—the only one to be apprehended—is easily avoided by strictly adhering to the rules given which are:—Give once a week each pot about 30 grammes of a solution of 4 grammes of the fertiliser in 1 litre of water; or, what is simpler, dissolve 1 gramme of the fertiliser in 1 litre of water, and with this give each pot a thorough watering once a week; the rest of the week give pure water. A common teaspoon holds 4 grammes of the fertiliser; therefore, such a measure is very useful for dosing a watering-pot holding 4 litres and does away with any need of weighing. The fertiliser is not patented; but the *Pharmacie Centrale*, 7, Rue de Jouy, are authorised to prepare it, and have it for sale in tin canisters as follows:—No. 1, for 50 litres, or 2,000 waterings, at 1 franc; No. 2, for 125 litres, or 5,000 waterings, at 2 francs; and No. 3, for 250 litres, or 10,000 waterings, at 3.50 francs. They also have a modification of it for vegetables, at 1 franc, 1.75 franc, and 5 francs. The doctor never made a mystery of his formula; he gave it out before the Academy of Sciences, and it was published in divers newspapers at the time (1872). I give it here, and it can easily be translated into English equivalents, and made up by any chemist:—

Azotate (nitrate) of ammonia	400	grammes.
Phosphate of ammonia	200	“
Azotate (nitrate) of potassa	250	“
Chlorohydrate of ammonia	50	“
Sulphate of lime	60	“
Sulphate of iron	40	“
Total	1,000	“
Versailles.		F. T. P.

FLOWER SHOWS.

WE suppose that a garden affords the most innocent and perfect pleasures. Lord Bacon thought so, and unphilosophical people who never trouble their heads about the inductive method are at least Baconian in this system. We are all supposed to trace down from “the grand old gardener and his wife,” and therefore have an inherited tendency towards flower shows. The man who does not love flowers is like Shakespeare's wretch who does not love music. The love of flowers is often the finishing grace of a noble character, the redeeming virtue of a debased one. Given the love of flowers, you may in the long run work out the love of many higher things. Moreover, these flower shows do a great deal to cement and decorate provincial life. The general tendency is to be metropolitan, or rather cosmopolitan, and everything that adds to the vigour, healthiness, and independence of country life, cannot be spared in these days. Of course people approach the matter of flower shows from various points of view. Some are terribly in earnest about the prizes. Indeed there is a fashion much to be reprobated in some rich

men's gardens for special cultivations which shall earn paragraphs in the newspapers and monetary prizes, while the general beauty and entirety is unseemingly disregarded. Such gardens are unlike Armida's or even Corisande's. The final sentence of "Lothair" occurs to us—"I have been in Corisande's garden, and she has given me a Rose." The sweet human Roses, in their white and red, blossom at our flower shows. Amid the beauties of animated Nature there are those which honest Goldsmith never classified. Unquestionably there is a good deal of honest criticism on Roses and Geraniums, and the show of Azaleas is always a strong point at a spring flower show. Moreover, there was a great deal of scientific interest in homely vegetables, and even non-scientific eyes view with suggestive complacency green Peas and early Potatoes. Still, as one watches the gay crowds promenading the paths and the smooth sward, or sipping ices and listening to music, it is easy to see that the people who come to the show really make up the largest part of the show itself. It is the opportunity for friendship and flirtation, for the intelligent study of fresh variegated toilets, for counting up our friends who are present, and discussing those who are absent. It is a matter of general congratulation on the excellence of a friend's gardener if a prize has been obtained, or we praise his kindness in sending Ferns and Orchids to aid the ornamentation of the scene. This, then, is one kind of flower show, the large, fashionable gathering to witness the highest outcome of floricultural art in this country. The world has no better show of the kind than the great *fête* days of the Botanical Gardens in our own Regent's Park. There is another kind of flower show increasingly coming into vogue, well deserving of all the help and sympathy that can be afforded. We, of course, mean the working-men's flower show. It is indeed plain and limited in comparison with the richer and more expensive exhibitions. We never knew a working-men's flower show whose working expenses might not be comprised within £40; the other kind of show must cost more than £400. But the moral gains, in the love of beauty, the quickened intelligence, the release from debasing tastes, are at least as great in the one case as in the other. Everyone who is acquainted with what Parson Dale called "the moral topography of a parish" knows the purifying and elevating effect which belongs to the thorough love of a garden among the poor. In a literal, and more than a literal, sense, the "solitary place is glad" and "blossoms like the Rose." Those who have attempted some such shows, especially in the Midland counties, know the great enthusiasm which they evoke, and the high degree of excellence to which they are carried. One of the very pleasing features of such exhibitions is the collection of the window plants by which the dwellers in lanes and alleys seek to make their poor tenements bright, and then, again, the collection of wild flowers made by the young children in wandering on holiday afternoons. To such shows as these a wet day is often almost ruinous, as the state of the exchequer almost depends on the receipts from visitors. We are glad to observe that there is a growing disposition on the part of the wealthy to supplement this source by subscriptions, which will render the prizes really worth the gaining, and also by sending ornamental contributions from splendid conservatories. Such kindness is the acknowledgment of a common taste among all classes for floral beauty, and of the healthy, invigorating, innocent pleasure which belongs to every kind of flower show.—"Globe."

TOUGHENED GLASS.

ON Wednesday evening, the 2nd inst., a paper was read before the Society of Arts by Mr. Perry F. Nursey, C.E., on toughened glass, a subject which has of late attracted considerable attention. The chair was taken by Colonel Strange, F.R.S., and the subject attracted a crowded audience. Mr. Nursey commenced by referring to the important part glass had played in promoting the advancement of civilisation, and to the antiquity of its manufacture, which he showed there was reason to believe was known to the children of Israel in their bondage. The origin of glass, he stated, had been attributed by Pliny to the Phœnicians, who happened to use some lumps of natron on the river shore for resting their cooking pots on, when the fire fused the natron and the sand together, and formed glass. It was more probable, he observed, that the idea was first suggested by the vitreous formation attendant upon the firings of bricks and pottery, and the reduction of metallic ores. After touching briefly upon the development of the glass manufacture in later times in Venice, France, and England, the author pointed out that we were now producing glass which did not differ materially as regarded its physical features from that made in the days of Pharaoh. He then described the physical features of Prince Rupert drops and the Bologna phials, with the object of showing that they and toughened glass were in no way analogous, but opposite; the drops being produced by dropping melted glass into cold water, and toughened glass being made by dipping the heated glass into a heated

oleaginous compound. Both the drops and the phials flew to pieces if the skin were scratched, while toughened glass was unaffected by being scratched by the diamond or cut with the wheel. Mr. Nursey then described the toughened glass of M. de la Bastie, its method of manufacture, and its peculiar characteristics, together with such physical features as had developed themselves as far as investigation had yet gone. It will only be necessary here to observe that the process of toughening consists in heating ordinary glass, and, while hot, dipping it into a heated bath of oleaginous matter. When used by glass manufacturers, the process of dipping would be substituted for the ordinary annealing process, whereby a great saving in time and cost for fuel and breakages would be effected. The author stated that the value of the invention had been appreciated by some of our leading glass manufacturers, who were negotiating with Messrs. Rey & Brothers, of 29, Mincing Lane, for licences to work M. de la Bastie's English patent. Messrs. Powell, of Whitefriars, had already put up experimental toughening tanks, and with incomplete arrangements had succeeded in producing imperfectly toughened glass. The author concluded his paper by observing that the invention was so remarkable, so unique, and apparently so fraught with import to the arts, sciences, and manufactures, as to render it probable that the name of De la Bastie would one day occupy no mean position among those of men by whose genius science had been enriched and the nations practically benefited. At the conclusion of the paper Mr. Nursey experimented with toughened and untoughened glass articles, showing the infinitely greater resistance to the force of impact possessed by the former over the latter. A square of ordinary plate glass, 6 inches by 5 inches by a quarter of an inch thick, was broken by a weight of 4 ounces falling on it from a height of 12 inches. The same weight was then dropped upon a square of toughened glass of similar dimensions from a height of 10 feet, but without breaking the glass. A weight of 8 ounces was then substituted with similar results. Mr. Nursey then threw the weight several times on the glass with great force without breaking it, but he ultimately smashed it with a hammer. Watch glasses, glass plates, coloured and plain, were then put to the test by being thrown violently on the bare floor without damage. One plate was dropped from a height of 5 feet on to an iron grating and rebounded into the air intact.

ROSE NAMES.

THE practice of naming flowers after private friends or public characters is very pretty; but it may be suggested that a little care in the selection of epithets bestowed on such names would not be amiss. Otherwise, it is difficult to say whether poetical compliment or covert satire of the sponsor is intended. What shall we say, for instance of the description appended to the names given to three new Roses, just "sent out" by a leading nurseryman, which we find in the advertising pages of last week's gardening papers? First shall come a lady, and, if the language is rather glowing, we trust that it is not on the whole displeasing to the fair prototype:

MISS HASSARD.—Beautiful delicate pinkish-flesh colour, large, full and fine form, very sweetly scented. First class either for exhibition or general purposes.

But the next is so ludicrously inappropriate that we only reproduce it in the assurance that the original bearer of the name would have smiled at the incongruity of the epithets:

JOHN STUART MILL.—Bright clear red, large, full, and beautiful form of great substance; well adapted for exhibition purposes, being also of strong constitution and free habit. Quite distinct.

Last comes a clergyman, himself a distinguished Rosarian, and we hope his parishioners recognise the portrait:

REV. J. B. M. CAMM.—Very bright rosy-pink, most pleasing colour, large, very full, and fine globular form; very sweet, constant, and thoroughly distinct; growth vigorous.

The moral touch, "very sweet and constant," is peculiarly appropriate to a clergyman, and will perhaps reconcile his admirers to the allusion to what some might deem the physical defects of a rosy-pink complexion and too globular form.—"Pall Mall Gazette."

Good Work for a National Garden.—A learned and practical savant, Mr. Dalbray, began in 1840 in the Garden of Plants, at Paris, a public course of lectures on arboriculture. These lectures were illustrated by experiments on the ground, and were largely attended by landowners and nurserymen from every part of France. In three years old routine systems of culture were done away with, and that of the Vine especially became so much improved that its products soon formed by far the largest item in the resources of that country.

PARIS FLORICULTURAL EXHIBITION.

THE Central Society of Horticulture in France holds, every year, one or more exhibitions in Paris; and, for several seasons, these have taken place at the Palais de l'Industrie, in the Champs Elysées, at the same time as the exhibition of paintings is held. This year, for reasons that it is unnecessary to explain here, this combination, which was advantageous to both parties, did not take place; and the Society of Horticulture had to seek another place for its show. This was found in the garden of the Tuileries, the exhibition taking place partly in the Orangery and partly in a large tent that had been erected for the purpose; but a great many of the horticultural productions were scattered about out of doors under the covered walks, and were exceedingly interesting, although the general effect, it must be confessed, was not as remarkable as might have been desired. The great white walls of the Orangery contrasted badly with the Palms and Rhododendrons which surrounded them; and, in this respect, the show was inferior to those held at South Kensington or the Royal Botanic Gardens. Nevertheless, many of the collections staged were very interesting; and amongst others may be mentioned that of M. Savoye, of Paris, who exhibited Palms, Ferns, Crotons, Dracaenas, and Marantas in excellent condition. MM. Léveque & Sons, the well-known Paris Rosarians, had the best collection of Roses perhaps ever exhibited in Paris. More than four hundred varieties, both Hybrid Perpetuals and Teas, were shown, occupying a space 150 feet long and 6 feet in width. At the back were standards, and next them those of less size, then dwarf plants, and, finally, garlands of cut flowers—an arrangement which produced an effect seldom equalled. Amongst Teas those which attracted most attention were Jean Ducher, Perle de Lyon, Perle des Jardins, and Belle des Massifs; and, among Hybrid Perpetuals, Paul Néron, Richard Wallace, Lyonnais, Comtesse d'Oxford, President Thiers, and Louis Van Houtte. From Algiers came *Chamærops humilis* and other Palms of an interesting character. Two beautiful clumps of Rhododendrons, comprising all the modern English novelties, were staged by MM. Moser & Croux. The *Gloxinias* of M. Vallerand were extremely beautiful, his collection this year numbering not fewer than 100 plants, several of which were furnished with from sixty to eighty flowers and more than that number of buds. The distinguishing characteristic of these *Gloxinias* is their dwarf and sturdy habit, the flower-stems not being more than 6 inches in height, and not one needed staking. Amongst the stronger plants were *Giraudæ*, *Corne d'Abondance*; and, amongst novelties, *Duchesse de Gallieze*, *Charme de Lutece*, *Madame Alphen*, &c. Amongst miscellaneous plants were annuals from MM. Vilmorin, Andrieux, & Cie., *Caladiums* from M. Bleu, and *Clematises* from M. Roy. Amongst novelties, one of the most interesting was a double-flowered new *Begonia*, exhibited by M. Lemoine, of Nancy. This, which appears to have sprung from *B. boliviensis*, is perfectly double; its colour being an orange-red. The flowers are large in size, and the plant appears vigorous. M. Glasse staged a collection of newly-introduced plants, amongst which *Anthurium crystallinum*, *Phyllotæmium Lindenii*, and *Vriesia Malzinei*, were conspicuous. M. Truffaut, of Versailles, contributed *Bromelia agavæfolia*, with scarlet bracts, reminding one of a *Nidularium*, but much larger and more effective. Amongst inventions exhibited were examples of double glazing and improved ventilators, and MM. Berger & Barillon, of Moulins, furnished a new vertical boiler. Such was this exhibition, which with all its shortcomings offered to visitors an opportunity of seeing much that was worth inspection.

A. T.

HELIOTROPE.

How strong they are, those subtle spells
That lurk in leaves and flower-bells,

Rising from faint perfumes;
Or mingling with some olden strain,
Strike through the music shafts of pain,
And people empty rooms.

They come upon us unaware,
In crowded halls and open air,
And in our chambers still:
A song, an odour, or a bird,
Evokes the spell, and strikes the chord,
And all our pulses thrill.

Faint-scented blossoms! long ago
Your purple clusters came to show
My life had wider scope;
They spoke of love that day—to-night
I stand apart from love's delight,
And wear no Heliotrope.

Between to-night and that far day,
Lie life's bright noon and twilight grey,
But I have lived through both:
And if before my paling face
The midnight shadows fall apace,
I see them, nothing loth.

Only to-night that faint perfume
Reminds me of the lonely gloom
Of life outliving hope:

I wish I had been far to-night,
What time the dew fell, silver-white

Upon the Heliotrope! —“All the Year Round.”

NOTES AND QUESTIONS—VARIOUS.

Mulching Peas.—Covering the soil for a space of 2 feet or so on each side of the rows of Peas with manure, or half-decayed litter, has at this season an astonishing effect upon both the quantity and quality of their produce; and on dry soils mulching should always be resorted to.—E. HODDAY, *Ramsay Abbey*.

Carter's Fern-leaved Parsley.—This is a distinct and beautiful variety, quite superior to our best strains of Curled Parsley for garnishing and other kitchen purposes.—DAVID LUMSDEN, *Blorholm*.

The Double Geum.—I have this now in flower, and agree with “G. F.” in his estimate of its merits. The flowers are of good size, and as double as those of a good double Geranium, which they much resemble. They are of a deep rich scarlet hue, and, having long stems, are invaluable for bouquets.—A. D.

Peas in Pots.—I would recommend Mr. Tillery to try for pot culture Laxton's new dwarf Pea Unique, or Dwarf William the First. This is a very perfect kind that branches early and produces fine deep green pods in abundance. It is several days earlier than Multum in Parvo, and on that account is specially valuable.—A. D.

New Cure for the Phylloxera.—This is not sulphuric carbonate of potash, as stated at p. 412; but sulpho-carbolate of potash. Anyone asking for sulphuric carbonate of potash would probably get sulphate of potash—a weak manure. Sulpho-carbolate of potash is a strong disinfectant and destroyer of low organic bodies.—T. FLETCHER, F.C.S., *Warrington*.

Campanula Garganica.—This beautiful pot, basket, or border plant comes into flower at the end of May, and furnishes multitudes of beautiful pale blue blossoms all through June. In the autumn each plant should be pulled to pieces and re-planted or potted as the case may be. Grown well in 60-sized pots it forms a useful plant for various kinds of indoor decoration.—D.

Strawberry Vicomtesse Hericart de Thury.—I have to-day (June 5th) gathered richly-coloured, well-ripened fruit from this Strawberry off yearling plants that were not growing on a warm border, but out in the open ground. This is remarkably early, and I certainly see no prospect of gathering from others for a week or more.—A. DEAN.

The Variegated Euphorbia amygdaloides.—This is now in flower on the new rockery at Kew; its leaves are distinctly margined with creamy-white, and its small orange-yellow blossoms, surrounded by bright golden green bracts conspicuously striped with dark green, are very effective. This, and the Golden Moneywort, well deserve a place wherever a suitable position can be found for them.—B.

Buddleia globosa.—This old-fashioned shrub is now blooming freely at Kew, and is, in appearance, so distinct from all its associates that it deserves a place wherever it will grow. It is liable to suffer during exceptionally severe winters, but a little mulching put over its roots will generally be found to save it. It is a common plant in various parts of the country, but seldom seen flourishing in the London district.—Q.

A barren Magnolia.—We have a *Magnolia grandiflora*, 16 feet high and 10 feet through, on a south wall. It has never bloomed since it was planted, yet it is in good health and makes a great quantity of shoots every year. Eighteen months ago I opened a trench all round the base of the tree, and filled it up with equal parts of loam and manure, hoping to induce it to flower, but without success. I shall be glad if any of your correspondents can give me any advice on the subject.—C. G.

Idesia polycarpa.—This handsome and little known plant, which some call *Polycarpa Maximowiczii*, is now showing bloom at Mr. Crawford's, at Lakelands, near Cork, where it is perfectly hardy, having been growing freely there for these last nine or ten years; it now forms a handsome bush, but has never before shown any sign of flowering. It is to be hoped that it will also ripen its fruit, which is said to be edible, but as yet is, I believe, only known in the form of dried specimens.—W. E. G.

Neapolitan Violets to Bloom in Winter.—Divide the old plants, and plant the runners on a cool border in rich light soil. Plant in lines a foot apart and 10 inches from plant to plant in the row. Keep the surface stirred, and give copious waterings in dry weather. In September, take the plants up with good balls, and plant them in a frame near the glass in a sunny and sheltered situation. Give plenty of air when the weather is severe, and keep off the lights altogether in mild autumn weather.—B. O.

Meconopsis Wallichii.—I have for some years been on the outlook for this plant, having seen it, I believe, figured as blue; but Mr. McNab in his account of the rock-plants at Easter Duddingston informs us that it is yellow, and that the blue one is *M. aculeata*. In the last edition of Paxton's “Botanical Dictionary” it is also said to be blue. Will Mr. McNab kindly set us right in this matter? I cannot call to mind where I saw it figured as blue, nor do I remember ever seeing the plant offered for sale.—T. WILLIAMS, *Ormskirk*.

Gloriosa superba Hardy.—According to Mr. T. Shortt, writing in the “Gardeners' Chronicle,” this beautiful old plant, generally considered a stove plant, is perfectly hardy. It succeeds best in a deep rich peat; a Rhododendron bed is a good situation, as it there finds support from the shrubs, and shows its flowers to great advantage. In cold and damp situations the foot of a north wall is advisable, all that is requisite being a dry bottom in winter, and sufficient depth of soil to secure them from frost.

Ferns and Manure.—Mr. A. P. Calder recently stated that two years ago he planted a Fern-house 120 feet by 10, and that he had used cow manure for the plants, which were thriving well. He had found this manure indispensable for all plants, but particularly for Ferns. He used it only when thoroughly rotted, and made a compost of one-half cow manure and the other half soil from the woods. There is no doubt that for Ferns planted out it may be used with the best effect. I believe Mr. Parsons used manure pretty freely for the enormous specimens of *Osmunda* and other hardy Ferns he used to grow.—W.

Planting the Common Brake under Trees.—I wish to establish this in a certain position under trees, and, having failed to do so, shall be glad of a little advice on the subject from some of your readers.—J. B. [Those who bring loam into their gardens have sometimes a little trouble in preventing this vigorous Fern from establishing itself and dis-establishing more valued plants. Therefore, a few loads of deep sods taken, in autumn or winter, from any place where the Brake grows freely, and placed in the positions where you desire the plant to grow, will effect what you desire.]

Mildewed Peas.—All my Peas after the middle of May are sown in trenches prepared as for Celery. We take out a trench 18 inches or 2 feet wide, and a good spade deep, and put in about 4 inches of manure, dig it in, then fill up with soil, give another coat of manure, and dig it in. When the Peas show flower, if the weather is dry, we give a good soaking with water, and mulch the ground on both sides of the rows to the distance of 18 inches. To have good late Peas it is necessary to water freely, dryness at the root being the main cause of mildew.—J. M.

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SATURDAY, JUNE 19, 1875.

[Vol. VII.]

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

PRESERVATION OF CUT FLOWERS.

THE best method of keeping cut flowers fresh ought to be known by all who are fond of floral decorations. Of course, to those who possess large gardens and plant-houses from which to cut daily, this is not so much an object; still, even these may require to send or take flowers some distance, and, unless they are properly packed or preserved, they will, at the end of a long journey, be quite faded and worthless. Where it is possible, flowers should always be cut from plants which have been well hardened off; in some instances, with flowers and foliage, this is not practicable, but, as far as possible, avoid those growing in a strong stove heat. In Ferns, well-matured fronds only should be cut, as young fronds are certain to shrivel up a few hours after being cut, and, consequently, spoil the effect of any decoration in which they may be employed. The stems of all flowers and Ferns should be severed with a sharp knife and not with a pair of scissors, the reason of this being that all stems have minute tubes or veins, through which, when cut, they draw moisture; if these be severed with a sharp knife they remain open, but if cut by scissors they are crushed and become closed, so that they cannot draw up the moisture; consequently they fade in a much shorter space of time than they otherwise would do. Having said so much in reference to the cutting, I shall now turn to the manner of keeping them in water, &c. If flowers are required to keep for only a day or two—I am not speaking of those arranged in vases or otherwise, but merely the sprays as cut from the plants—each variety of bloom should be sorted out and tied into bunches, and these bunches should then be placed in earthen jars or jam-pots, filled with cold water, which should be placed in some cool, dark place till required for use—the wine-cellar is as good a place as can be selected. Many flowers, such as Gardenias, Stephanotis, &c., keep better if cut and placed in water than if left growing on the plant; but, as this class of flowers has short stems, they should be placed in shallow vessels. If Ferns be tied up in bunches like the flowers, it is a good plan to dip them in a pail of water before placing them in the jars; but, if there are any gold or silver varieties amongst them, water should never be allowed to touch them, or it will wash off all the meal. Florists have drawers of zinc, in the bottom of which wet Moss is placed, and on this the blooms are laid; but amateurs are not supposed to have these at hand, and a few tin boxes with air-tight lids—old biscuit cases, for instance—will be found to suffice, and answer the purpose equally well. I have placed fronds of *Adiantum cuneatum* (Maiden-hair) in a tin biscuit box on a Saturday afternoon (the fronds having been well submerged in water first), and when opened on the following Thursday afternoon they were as fresh as when cut from the plant. Many flowers are made to last fresh a much longer period than they otherwise would by means of wiring and gumming, but this comes more under the head of mounting and preparing than of preserving them. Some think charcoal and sal-ammoniac, if placed in water, preserve flowers; but I have tried this and many other methods and found nothing better than spring water as cold as possible. Where small floral arrangements only are employed it will be found a good plan in the evening to lift the blooms out of the vases and place them in a basin of fresh water to stand all night, and submerge the Fern fronds; then, in the morning, fill up the vases with fresh water, and, before the flowers are about to be arranged in them, cut both their stems and those of the Ferns afresh in a slanting direction; the removal of the smallest piece of stem will be enough, for it is only to keep the tubes of the stems open that this is done, as they become closed after being in the water a certain time, and so cannot draw up the moisture required to keep the blooms fresh. Vases of flowers can be kept fresh for a week at a time if they are thus treated. Flowers can also be packed to pass safely through the post and arrive fresh at their destination by a little care and manage-

ment. I have constantly sent by post, all through the winter, boxes of *Maréchal Niel* Roses, *Gardenias*, and flowers of this description, which have always arrived safe and fresh, and the plan I pursue is as follows:—The little boxes in which I pack them are generally 1 lb. tin canisters. I roll each flower in a piece of wet cotton wool and pack them, not too tightly, but so that they will not shake about, and I find that a dozen *Gardenias* can easily be packed in one such box without crowding. Having put on the lid I cord up the box and paper it, leaving the ends open, and the flowers will arrive at their destination at the end of three days as fresh as when packed. If this practice were more generally adopted many could, in large towns, receive fresh flowers from their more fortunate friends in the country.

A. HASSARD.

BUDDLEIA GLOBOSA AND CISTUS LAURIFOLIUS.

A VERY pretty and attractive combination is formed by the association of *Buddleia globosa* and *Cistus laurifolius* in clumps or banks. The *Buddleia* is somewhat taller than the *Cistus*, rearing its spikes of globular clusters of orange flowers above the mass of foliage of both shrubs. While the *Buddleia* is yet in bloom the *Cistus* is gradually unfolding its inflorescence and displaying its white and red-tinted strongly-nerved floral bracts, contrasting pleasingly with its own dark foliage, the lighter green of the leaves of the *Buddleia*, and the flowers of the latter. The foliage of both is clothed with a silvery-tomentum on the under surface, glimpses of which are revealed by every breath of air. The flowers of the *Buddleia* are of considerable duration, and, before they are over, the more evanescent white-petaled crumpled blossoms of the *Cistus* begin to expand. Although the individual flowers of the *Cistus* last only one day, there is a long succession of them—each morning presenting a fresh array. Both of these charming shrubs have persistent leaves, and the *Cistus* may be termed a true evergreen. They thrive best in a well-drained soil in an elevated situation; we have seen them in perfection on the chalk, and in the vicinity of the sea on the south coast. In low humid places, especially where the soil is rich and heavy, the wood does not ripen so well; hence, they are almost invariably rendered unsightly by the frosts of winter. The *Buddleia* is liable to be stripped of its foliage in more favoured spots during very severe weather. It is a native of temperate South America, a country whence we obtain few hardy plants, but those few are exceedingly valuable—*Berberis Darwinii* to wit, several species of *Escallonia* (so useful for covering walls, &c., near the sea), and the beautiful *Passion-flower* (*Passiflora cœrulea*). Doubtless many other things yet remain to be introduced, that will some day play no unimportant part in the embellishment of parks and gardens in the south-western parts of the kingdom. Our *Buddleia* was introduced about a century ago, and in the rich orange colour of its flowers it stands alone among our flowering shrubs. The *Cistus*, like all its congeners, is from the Mediterranean region; but it is much hardier than many of the species, not having been materially injured, even on the stiff clayey loam in the Weald of Sussex since the winter of 1860-61. Moreover it pushed up again from the root after that severe season. Some of the species have much more showy flowers than *C. laurifolius*; and nearly all of them will succeed in dry situations, such as we have indicated, and in the neighbourhood of the sea in all but the coldest and wettest parts of the kingdom.

W. B. H.

A Valuable Shrub (*Cratægus Pyracantha* var. *crenata*).

—This is the best shrub yet tried in Ireland for covering wall surfaces. The old *Pyracantha* is only semi-evergreen in severe winters; this variety is quite evergreen, has a better substance of leaf, and a more glossy green. It is hardier than the common form; the severest winters do not affect it, and the berries are larger and better coloured than those of the *Pyracantha*. I have now had fifteen years' experience of it, and it is the best plant I know of for covering high walls in exposed places. I got it from the Comely Bank Nursery, sixteen years ago, and there are now many fine specimens in the College Botanic Gardens, at Dublin. It is readily increased by layers, strong plants, 2 feet high, being obtained in this way in one year.—JOHN BAIN.

NOTES OF THE WEEK.

— FIELDS covered with young Tomato plants are now not uncommon in the neighbourhood of London. Although in our climate the Tomato can never be grown so easily as a field crop as in warmer countries, yet it has been proved to ripen well in the London market gardens, and perhaps some of the newer kinds may prove an early variety suited to our climate.

— THE handsomest rock or Alpine shrub we have seen for a long time past is now flowering in the Wellington Nurseries, St. John's Wood. It is *Æthionema grandiflora*, which, unlike its older brethren, ascends to the dignity of a compact bush 12 to 16 inches high, bearing numbers of beautiful flowers, arranged in spikes, which are rosy at first, but afterwards change to white. These two hues being visible in all the spikes, the effect is very charming. The plant is worthy of a place in every rock-garden.

— MESSRS. CARTERS' cup, offered as a prize for the best vegetables raised from their seed, will be competed for at the Royal Horticultural Society's Gardens, South Kensington, on July 7th. Besides the cup, which is valued at 50 guineas, and which becomes the property of the employer in whose garden the winning collection of vegetables is grown, a prize of 10 guineas will be awarded to the gardener who has raised them. There are, besides, three other prizes, of the value respectively of 7, 5, and 3 guineas, all of which, including the cup, must be competed for only by gardeners in the employ of gentlemen; the vegetables, except Cucumbers and Melons, must be grown in the open air.

— A NEW form of Potato disease has appeared in the Royal Horticultural Society's gardens at Chiswick and elsewhere. It is a Fungus which attacks the plant when young. The discovery has only just been made, and the disease is being investigated by the Rev. M. J. Berkeley, who regards it with considerable alarm, as probably more formidable than even the old form of Potato disease itself. At Chiswick, its effects have been most disastrous, the entire crop of the American varieties having been destroyed, the tubers never advancing beyond the size of small kernels. It is said to be confined to these varieties, many affected leaves of which have been sent to us from Northumberland. Many years ago, Potato crops suffered occasionally from a disease called the curl. The present complaint is similar to it in outward appearance, although very possibly, indeed, most probably, it is produced by another cause. Our Northumberland correspondent mentions that a friend of his in the neighbourhood of Alnwick, who had reared his plants of Snowflake in pots, has had none of his Potatoes attacked by it.

— MR. CHARLES MOORE writes to us from the Botanic Gardens, Sydney, as follows:—"I am now busy preparing for my winter operations on the new ground lately added to this garden. This will enable me to plant out, with good effect, many of the more hardy plants which I obtained while in Europe last year. As a whole, I made a splendid collection of really beautiful plants, thanks to the liberality of my friends, especially Messrs. Veitch, Linden, Henderson, Bull, Lowe, and my brother, Dr. Moore, of Glasnevin. I am now, and have been since I returned, most anxious about securing suitable plants to send to England in return for those which I have received; but this is more difficult than at first sight might appear. The fact is the majority of the plants at our command here have been sent to Europe, and particularly to England, in such numbers that they have ceased to be of any value in the way of exchange, and one is driven to look elsewhere—i. e., to other countries—for plants likely to be acceptable from this quarter. This difficulty has determined me to send a collector on a cruise, which will occupy about six months, in the missionary ship, "John Wesley." This vessel will touch at the Fiji, the Friendly, and Samoan Islands, the Caroline Group, the Solomon Islands, New Britain, and perhaps New Guinea. My man, a young Dane, will have for fellow-passengers Baron A. Von Hugel and his three assistants (one a photographer), who are also going in pursuit of scientific objects. The results of this voyage will, I trust, enable me to send home some novelties in every way worthy of cultivation. Another ship will shortly sail from this on a purely scientific mission to New Guinea. This vessel, chartered at the sole expense of one of our wealthy colonists, Mr. William Macleay, will be fitted up specially for the convenience and comfort of that gentleman and his assistants; and, although botany is not his particular forte, yet it will not be neglected, as he has given permission to his friend, Sir Wm. McArthur, to send with him three botanical collectors, and if, therefore, New Guinea be as rich in beautiful plants as there is every reason to suppose it is, what a glorious collection of grand things may be looked for. Yet both Sir William McArthur and myself may be disappointed in our expectations. We can scarcely hope to add much to the Crotons or Dracænas superior to those already introduced; our anticipations are more favourable as regards Palms, Ferns, and

Orchids. At all events, these two expeditions will, I imagine, prove a fair test of what plants may be obtained or expected from these islands.

— MR. JOHN NUNN informs us that in a stove at Penllergare a plant of *Aërides odoratum* has produced seventy-two flower-spikes, many of which have over fifty flowers upon them.

— THE large Cantaloupe Melon of the Paris market gardens is now abundant in our markets. This Melon is preferred by many to the common green-fleshed kinds, and we share their desire that it should be more frequently grown in this country.

— THE jury of the Exhibition of the French Central Society of Horticulture has awarded a large gold medal to M. de la Bastie for his discovery of toughened glass, on account of the services it is likely to render to horticulture.

— THE scarlet-berried *Cratægus Pyracantha* (*P. japonica*) fruits much better, it is said, when grafted on the Quince than when grown on its own roots. This plant is so valuable for covering walls that any treatment which ensures or augments its fruiting is well worth attention.

— THE richly laden flower-shoots of *Tropæolum polyphyllum* are now among the most attractive subjects in the large collection of good hardy plants in Mr. Ware's Nurseries at Tottenham. The large single white Rose is also a flower of great beauty and one which is worthy of general cultivation.

— IN a corner of the Cactus-house at Kew a plant of *Carica cundinamarcensis* has produced five well-formed fruits. They are pendulous, about the size of a hen's egg, somewhat Pear-shaped, with the large end near the stalk. Their colour is dark green at present, for they are not yet ripe.

— THREE plants of Fortune's Palm (*Chamærops Fortunei*) in front of the Aroid-house at Kew are now coming into bloom. Their inflorescence, consisting of a much-branched panicle a foot or more in length, is bright lemon in colour, and contrasts strikingly with the deep green hue of the foliage and matted fibrous trunks. The three plants range from 6 to 10 feet in height.

— WE are requested to draw the attention of intending exhibitors at the horticultural exhibition to be held in the Lower Grounds, at Birmingham, on July 1st and following days, to an announcement in our advertising columns, that, in compliance with expressed wishes, the last day for sending in entries has been fixed for Thursday next, June 24th, instead of the earlier date previously announced.

— SEVERAL large clumps of *Lilium Humboldtii* promise shortly to be in bloom in the Wellington Road Nursery. It bears rich orange-yellow brown-spotted flowers, ten or twelve together on a stem, which is sometimes as much as 10 feet in height, but more generally 3 or 4 feet. Its glaucous, undulated, shining leaves are borne ten or twelve together in regular whorls. It is one of the hardiest and best of all the new American Lilies.

— WE hear of a new race of very dwarf Cinerarias, through the medium of the "Journal of the Central Horticultural Society of France." They are said to be uniformly very dwarf, and, withal, to produce large and perfect flowers. They were shown by Messrs. Vilmorin, who are known to take great pains to ascertain the merit of their new introductions.

— AN effort, having for its object the preservation to the public of the large trees at present in the gardens of Northumberland House, has been commenced, and a deputation has been appointed to wait upon the Board of Works, asking that body to take steps for their preservation and removal to the ornamental gardens on the Embankment, more especially the new garden facing Whitehall.

— THE Australians find fruit-drying a very easy process. At the North-Western Province Society's show, held at Carisbrook on the 8th ult., a miner residing at Adelaide Lead exhibited samples of five different kinds of dried fruits, namely, Plums, Grapes, Apricots, Peaches, and Apples, all of which were so good that he was awarded a special prize for each. Some of them, dried five years since, when tasted, had all the flavour of new and good fruit. We hope samples of these may soon find their way to our English markets.

— ALL interested in pleasing combinations of hardy flowers should note the fact that the old blood Geranium (*G. sanguineum*) forms what is perhaps the most beautiful of all edging plants throughout the early summer months. Its graceful foliage, compact but still elegant habit, deeply-coloured handsome blooms, and long period of blossoming are all in its favour in this respect, and make it well suited for a margin to masses and groups of Lilies, Irises, Delphiniums, and other families of hardy plants that bloom at this season.

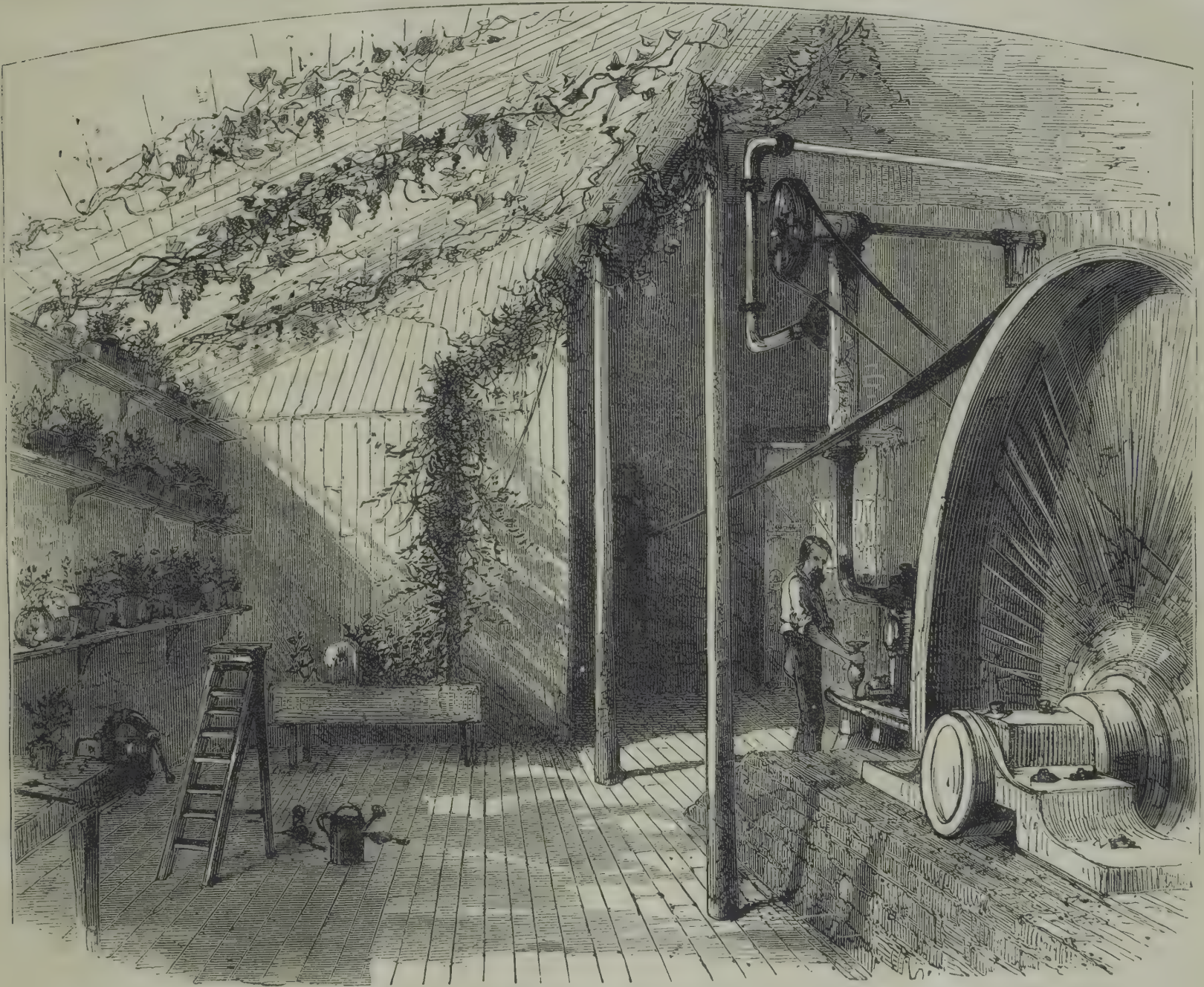
A GREENHOUSE IN AN ENGINE-ROOM.

SOME time ago, Mr. A. Dawson called our attention to the fact that in the well-organised and interesting factories of the Waltham Watch Company, at Boston, Massachusetts, the engine-room is converted into indoor gardens. Through the courtesy of the London representatives of that firm in Hatton Garden we are now enabled to give a view of this. The chief engineer, being fond of plants, conceived the idea of cultivating them in his leisure moments in the engine-room, and, taking advantage of a considerable amount of glass roofing surface, he succeeded in making what is described to us as a beautiful but peculiar hothouse. We understand that in forming the surroundings of this factory a noteworthy amount of thoughtfulness and good taste has been displayed in planting and gardening. There is nothing that suggests the usual close and sunless dinginess of the manufactory. Windows, opening at all points, let in floods of light,

THE FLOWER GARDEN.

GARDEN VEGETATION IN MAY.

THE month of May, upon the whole, was generally cool. The lowest thermometer readings were on the mornings of the 1st, 4th, 16th, 17th, 19th, and 22nd, when 38°, 36°, 39°, 34°, 35°, and 39° were indicated, while the highest morning temperatures were on the 6th, 9th, 14th, 15th, 21st, and 28th, when 46°, 48°, 49°, 48°, 46°, and 46° were respectively indicated. High winds were prevalent during a considerable portion of the month, with occasional showers, but no heavy rains, the soil being scarcely ever moistened deeper than half an inch. This excessive drought, with that of the previous months, has proved a great drawback to the proper maturing of the foliage of



A Greenhouse in an Engine-room.

give access to the fresh breezes, and open the prospect to charming scenery. On one side is the beautiful river, on the other a park surrounded by the neat cottages of the workmen, while the quadrangle within, with its summer-house and fountain, is planted with ornamental shrubs. In fact, the whole aspect and spirit of the place betray the intelligent sympathy of the managers with their large family of working-people, men, women, and children.

Botanical Names.—The only use of a great part of our existing nomenclature is to enable one botanist to describe to another, a plant which the other has not seen. When the science becomes approximately perfect, all known plants will be properly figured, so that nobody need describe them; and unknown plants be so rare that nobody will care to learn a new and difficult language, in order to be able to give an account of what in all probability he will never see.

—PROSERPINA.

ordinary forest trees, and also to the planting out of annuals and young perennial herbaceous plants. It is also telling severely on many spring-planted evergreen shrubs and young nursery stock, particularly members of the Coniferous tribe, such as *Pinus*, *Abies*, *Picea*, and *Larix*. With the exception of the Plane and Elm, the foliage of few other forest trees at this time (1st June) is thoroughly developed. Many of the American forest trees are still far behind, such as the Liquid-amber, Tulip tree, Pseud-Acacia, American Plane, and Ash, deciduous Magnolias, Nettle tree, Planera, Honey-locust, Hop Hornbeam; also the Hickory, Chestnut, and common Walnut, while the deciduous Cypress and Catalpa are scarcely showing a leaf. Flowering trees, and certain large deciduous flowering shrubs, have been remarkably fine during the month; indeed, rarely does such a show of blossom occur,

but in many cases it has been of short duration, owing to the dry state of the ground. Scarlet and common Horse Chestnut, Bird Cherry, White Beam tree, *Pavia flava*, *Mespilus germanica* and *grandiflora*, white and yellow Broom, white, scarlet, and double-flowering Thorns—indeed, all the varieties of the *Cratægus* tribe—were at their best between the 15th and the end of the month. Laburnum, particularly the varieties known as the English type, have been remarkably fine, while the variety known as the Scotch Laburnum (*Cytisus Laburnum alpinus*) showed only a few flowers, except in the case of individual specimens, which flowered sparingly last year. The trees are generally strong, many of them being 40 feet in height. Last year, with the exceptions just alluded to, this so-called Scotch variety blossomed profusely. At the July meeting last year, it is recorded (*vide* "Botanical Society's Transactions," page 185) that a large Service or White Beam Tree, growing in the Botanic Garden here, assumed a remarkable appearance, two-thirds of the tree being covered with fruit, while the remaining third, facing the west, was clothed with rich green leaves, having no flower or fruit. This season the portion flowerless last year is covered with blossom; while on the other part only a few flowers are observable, and those not fully developed. Hollies of every description, during May, have been loaded with bloom; and, for a time, the ground below them was white with the fallen flowers. They are now covered with innumerable small green berries, betokening, as is generally alleged, a severe winter, although this has proved not always to be the case. Turkey Oak, Walnut, Chesnut, Ash, Birch, Plane, Hornbeam, and many other forest trees are also abundantly in flower, although presenting little show in comparison with the trees previously enumerated. Towards the end of the month the flowering Ash, *Fraxinus Ornus*, was particularly full of bloom. The Lime tree has all the appearance of flowering profusely. This year blossoms are very abundant on many medium-sized Coniferous trees, particularly the *Pinus* section. The finest flowering are *Pinus excelsa*, *Cembra*, *Edgariana*, *tuberculata*, *sylvestris*, some of the kinds being particularly rich in colour, such as the *P. Murrayana*, which, although only 6 feet in height, is red with male flowers. *Picea Douglasii* and *P. nobilis* have also a considerable sprinkling of flowers on them. Many of the Cupressinæ tribe are covered with fruit, such as *Thuja borealis*, *Thuja gigantea*, and *T. Craigana*; also many varieties of Cupressus, including numerous forms of *C. Lawsoniana*. For comparison with future years, I may state that the following trees were observed to be in full bloom, or rather, I should say, in their best condition, on the dates annexed to them:

May 18. Horse Chestnut
Common Lilac
20. English Laburnum
Pavia flava
Hollies of sorts

May 22. White Thorn.
25. Persian Lilac
28. White Beam tree
29. Scotch Laburnum
30. *Fraxinus Ornus*

The dry state of the surface-soil was very unfavourable for many flowering shrubs, such as *Rhododendrons*. Although flower-buds were particularly abundant few were properly matured, except in cases in which water was freely given. Ghent Azaleas flowered profusely, although only for a short time. In consequence of the drought caterpillars are becoming very numerous on the foliage of Lime trees, as well as on that of the Apple, Gooseberry, and Rose. During the early months all the varieties of wall stone fruit were richly covered with blossom; but, with few exceptions, fruit is not well set. The hot sun and drought which prevailed at the time must have injured the blossom. Apple and Pear trees, both on walls and as standards, show a plentiful crop, while Gooseberries, Currants, Raspberries, and Strawberries, have every appearance of yielding an abundant supply. The dry state of the weather, and much sun-heat, have been instrumental in bringing rapidly forward the flowers of many herbaceous and Alpine plants. Subjoined is a list of them as they came into bloom, chiefly on the rock garden here. This list does not include a number of the genus *Saxifraga*, *Sedum*, and *Sempervivum*, or of many Alpine Carices and Grasses, except in cases where they are known to be rare and interesting. At the present time (June) 300 species and varieties, exclusive of duplicates, have been counted in flower. Amongst the plants yielding the greatest display are the *Helianthemums* or Rock-roses, both

single and double, in all shades of colour—yellow, white, pink, and red. All the variety of *Saxifraga* are now at their best, particularly the pyramidal flowering species, also dwarf Phloxes, Aubrietias, *Rosa alpina pyrenaica*, *Veronica verbenacea*, *alpestris* and *V. Guthriana*, *Erinus alpinus* and *E. hispanicus*, *Iberis corifolia*, *Primula luteola*, *Saponaria ocymoides* major, *Daphne Cneorum*, *Onosma echioides*, *Pentstemon procerum*, *Meconopsis aculeata*, *Lithospermum prostratum*, *Linaria alpina*, *Trifolium uniflorum*, *Anthyllis vulneraria rubra*, *Fritillaria Kamtschatica*, *Papaver alpinum* (with its varieties in red, orange, and yellow,) *Erigeron Roylei*, *Hippocrepis helvetica* and *comosa*, *Genista sagittalis* and *pilosa*, *Oxytropis cyaneus*, *Dianthus alpinus*, *Campanula thyrsoidea*, *Dryas octopetala*, *Rhododendron ferrugineum* and *hirsutum*, *Erica hibernica alba* and *h. stricta coccinea*, &c. From the white *Iberis corifolia* to the black *Fritillaria Kamtschatica* flowers of all shades make one rich mosaic work.

Plants in Bloom in May, 1875.

- | | | |
|--|--|---------------------------------------|
| 1. <i>Mahonia glumacea</i> | 12. <i>Azalea amcena</i> | 20. <i>Viola stagnina</i> |
| <i>Primula Palinuri</i> | <i>Carex Vahlia</i> | 21. <i>Alchemilla penta-</i> |
| <i>Salix herbacea</i> | <i>Daphne Cneorum</i> | phylla |
| <i>Saxifraga pedemontana</i> | <i>Ranunculus uniflorus</i> | <i>Aquilegia cœrulea</i> |
| <i>Trifolium uniflorum</i> | <i>Saxifraga nivalis</i> | <i>Patrinia nudicaulis</i> |
| <i>Veronica pectinata</i> | (Scotch) | <i>Veronica saxatilis</i> |
| 2. <i>Myosotis alpestris</i> | 13. <i>Chlorogalum Leichtlinii</i> | <i>rubra</i> |
| <i>Saxifraga nivalis</i> | <i>Erica australis</i> | 22. <i>Anthyllis vulneraria</i> |
| (American var.) | <i>Pentstemon Menziesii</i> | <i>rubra</i> |
| <i>Thalictrum alpinum</i> | 14. <i>Erinus hispanicus</i> | <i>Erigeron alpinum</i> |
| <i>Vella Pseudo-cytisus</i> | <i>Houstonia cœrulea</i> | <i>Eriogonum subumbellatum</i> |
| 3. <i>Carex Fraseri</i> | <i>Petrocoptis pyrenaica</i> | <i>Linaria pilosa</i> |
| <i>Cornus canadensis</i> | <i>Ranunculus alpestris</i> | <i>Saxifraga Guthriana</i> |
| <i>Phlox Nelsoni</i> | 15. <i>Ajuga orientalis</i> | <i>variegata</i> |
| <i>Rubus arcticus</i> | <i>Arenaria purpurascens</i> | 23. <i>Astragalus Leontinus</i> |
| <i>Saxifraga virginensis</i> | <i>Cortusa Matthioli</i> | <i>Genista hispanica</i> |
| <i>Tulipa pulchella</i> | <i>Gentiana alpina</i> | <i>Iris tenax</i> |
| <i>Wulfenia carinthiaca</i> | <i>Linnaea borealis</i> | <i>Saxifraga nervosa</i> |
| 4. <i>Anemone alpina</i> | (American) | 24. <i>Anemone palmata</i> |
| <i>Menziesia globularis</i> | <i>Linum alpinum</i> | <i>Dianthus alpinus</i> |
| 5. <i>Cerastium alpinum tomentosum</i> | <i>Onosma echioides</i> | <i>Pernettya speciosa</i> |
| <i>Ledum buxifolium</i> | <i>Pentstemon procerum</i> | <i>Silene maritima rosea</i> |
| <i>Linaria alpina</i> | <i>Potentilla Lupinoides</i> | 25. <i>Erodium macrodendrum</i> |
| 6. <i>Arenaria balearica</i> | <i>Viola stricta</i> | <i>Saxifraga valdensis</i> |
| <i>Gunnera magellanica</i> | 16. <i>Arenaria ciliata</i> | <i>Saxifraga nepalensis</i> |
| <i>Lychnis lapponica</i> | <i>Astrantia minor</i> | 26. <i>Anthemis Aizoon</i> |
| <i>Primula auriculata</i> | <i>Coronilla minima</i> | <i>Camassia Kellyana</i> |
| <i>Streptopus roseus</i> | <i>Dracocephalum grandiflorum</i> | <i>Campanula thyrsoidea</i> |
| <i>Uvularia sessilifolia</i> | <i>Erinus alpinus albus</i> | <i>Dianthus glacialis</i> |
| <i>Veronica Guthriana</i> | <i>Iberis Tenoreana</i> | <i>Genista pilosa</i> |
| 7. <i>Alyssum alpestre</i> | <i>Meconopsis aculeata</i> | <i>Mœhringia muscosa</i> |
| <i>Anemone Popeana</i> | <i>Pernettya candida</i> | <i>Oxytropis Hallerii</i> |
| <i>Potentilla tridentata</i> | <i>Phlox divaricata</i> | <i>Papaver alpinum aurantiacum</i> |
| <i>Salix serpyllifolia</i> | <i>Saxifraga Clusii</i> | <i>Pentstemon humilis</i> |
| <i>Veronica glacialis</i> | <i>Trifolium alpinum</i> | <i>Ranunculus plantagineus</i> |
| 8. <i>Alyssum spinosum</i> | 17. <i>Anthyllis montana</i> | 27. <i>Aquilegia alpina</i> |
| <i>Cornus suecica</i> | <i>Iberis jucunda</i> | <i>Bellium corsicanum</i> |
| <i>Dryas octopetala</i> | <i>Linaria organifolia</i> | <i>Dianthus eximius</i> |
| (Scotch var.) | <i>Lychnis alpina</i> | 28. <i>Galax aphylla</i> |
| <i>Iris cristata</i> | <i>Rosa alpina pyrenaica</i> | <i>Potentilla ambigua</i> |
| <i>Saxifraga Mawana</i> | 18. <i>Achillea Clavennæ</i> | <i>Æthionema membranacea</i> |
| <i>Silene acaulis alba</i> | <i>Anthyllis erinacea</i> | <i>Dryas octopetala minima</i> |
| 9. <i>Androsace villosa</i> | <i>Campanula pulla</i> | <i>Phleum alpinum</i> |
| <i>Antennaria dioica rosea</i> | <i>Fritillaria kamtschatica</i> | <i>Rhododendron ferrugineum album</i> |
| <i>Erodium cinereum</i> | <i>Linnaea borealis</i> | <i>Vaccinium Mortenia</i> |
| 10. <i>Erinus alpinus</i> | (Scotch var.) | 29. <i>Astragalus alpinus</i> |
| <i>Globularia trichosanthes</i> | <i>Menziesia polifolia glabra alba</i> | <i>Cheiranthus longifolius</i> |
| <i>Iberis corifolia</i> | <i>Pæonia tenuifolia pleno</i> | <i>Dianthus neglectus</i> |
| <i>Iris iberica</i> | <i>Saxifraga Aizoon minor</i> | <i>Papaver alpinum album verum</i> |
| <i>Myosurus minimus</i> | 19. <i>Delphinium nudicaule</i> | 30. <i>Alopecurus alpinus</i> |
| <i>Potentilla frigida</i> | <i>Oxytropis cyaneus</i> | <i>Helonias dioica</i> |
| <i>Primula luteola</i> | 20. <i>Erigeron Roylei</i> | <i>Smilacina borealis</i> |
| <i>Saponaria ocymoides major</i> | <i>Gaultheria carnea</i> | 31. <i>Pernettya Pentlandii</i> |
| <i>Silene acaulis exscapa</i> | <i>Globularia cordifolia</i> | <i>Tofieldia americana</i> |
| <i>Smilacina bifolia</i> | <i>Pernettya candida</i> | |
| 11. <i>Saxifraga Bucklandii</i> | <i>Ramondia pyrenaica</i> | |
| <i>Saxifraga cuneifolia</i> | <i>Viola palmata</i> | |
| <i>Erodium Reichardii</i> | | |
| <i>Primula Parryi</i> | | |

Botanic Gardens, Edinburgh.

JAS. M'NAB.

RUSTIC ARBOURS.

As these are generally used as quiet retreats where time can be wiled away with a book, in conversation, or in some light employment, they are not often situated near the mansion or within sight of the flower-beds, but rather in secluded nooks and corners. At the same time the spot selected may be made as varied as the nature of the surroundings will permit. On one estate with which I am acquainted arbours are numerous. One is on the summit of a wooded hill, far away from noise

and bustle, but overlooks a landscape of surpassing beauty; another is in the deep solitude of the thickly-wooded glen or ravine, near a river. Travellers through the wood come all at once upon a neat but thoroughly rustic hut, standing in the centre of a little oasis of velvety lawn, enclosed by a rustic fence made of unbarked stakes, almost hidden everywhere by Roses, Sweetbriar, Honeysuckle, &c. On the Grass there are one or two rustic flower-baskets draped with Ivy, in which are growing bouquets of sweet-scented and other flowers; and, behind, the enclosure is backed up by a pile of roots thrown roughly together, among which grow wild Ferns in profusion, and other hardy plants that thrive in the shade of the tall trees. The small enclosure, which is chiefly laid down with Grass, is kept in just sufficiently good order to create a contrast to the surrounding scene, in a spot so rugged and remote, without in the least detracting from the rusticity of the picture. Another of these retreats is situated in an out-of-the-way corner of extensive pleasure grounds, where a stranger would hardly discover it; there is a romantic charm in having such places in undiscoverable spots. A little pathway turns abruptly off the main walk, and, winding away up the wooded declivity, amongst a thicket of wild undergrowth, lands the explorer on a little plateau, in front of a summer-house so rustic in appearance as scarcely to be detected at a distance among the surrounding trees. The house is of octagon shape. The roof, which is conical in form, and thatched with heather, is supported on eight Oak tree trunks, about 12 inches in diameter, and 7 feet high, and which, having been stubbed up, and not inserted too deeply in the ground, appear as if they had grown where they are placed, at the octagonal angles, the branches having been lopped off and rounded, but not too near to the trunk. The spaces between these rustic columns are boarded up substantially, but so as to leave the tree-trunks visible, both inside and outside. On the outer side, the boards are completely covered with unbarked sapling Oak wood, split, and about 3 inches broad, the pieces being nailed on closely together in rustic pattern work. One of the octagonal sides forms the doorway, to which is attached a porch constructed on the same principle, and at three of the other sides are Gothic windows, or "look-outs," but not glazed. The eaves project considerably, and appear to be supported by Gothic arms—bent Oak branches—thrown out from the tree supports. Inside, the roof and sides are lined with the Silver Moss or Lichen, put on almost as evenly as the pile of a carpet; while here and there appropriate heraldic devices are worked in with darker-coloured materials. The floor is paved with sectional blocks of Larch, planed, smoothed and put together in honeycomb form; and the seats are of Ling woven firmly together. Of course, while adhering to the thoroughly rustic style here indicated, the design may be varied by using different materials in the construction. For instance, I have seen Spruce tree trunks used for supports with good effect, also Larch; but gnarled tree trunks look best; while the inside surfaces may be lined with Sphagnum, washed and bleached before using, and after being put on it may be clipped smooth. Structures such as I have described are inexpensive, and may be erected by handy labourers from materials at hand. Arbours and summer-houses are now among the exhibits of miscellaneous horticultural appliances at the great flower shows; but, though most of them have some pretensions to rusticity, they are not, as a rule, attractive structures. At least, I cannot imagine that the kind of sentry boxes which pass for them, and which are made of such materials as peeled sticks stained and varnished, furnished with paltry windows of stained glass and internal decorations of the same fanciful order, are exactly the things anyone would choose for a quiet corner of his pleasure grounds. These remarks do not apply to all, however, for I have seen some portable structures of this kind in which considerable taste and judgment were displayed, in adapting them to all possible situations and circumstances. The kind of arbours which I have tried to describe are, of course, of considerable size—sufficient, perhaps, to accommodate a score of people—and are as much as possible in keeping with the situation. Bowers and summer-houses, such as are generally provided near the house, and in places where they may afford shelter in an emergency, are less substantial erections generally; but they, too, should always be of a rustic

character, as far as may be consistent with comfort. For example, painted deal seats and fittings are incongruous in such places, and may always be easily avoided. Externally the structure may be draped with climbers, such as the Virginian Creeper—than which there is nothing better—the Clematis, Aristolochia siphon, Roses, or Honeysuckle. J. S. W.

DOUBLE YELLOW AURICULA.

I RECEIVED blooms of the Auricula, of which the accompanying is an illustration, from Devonshire some time ago; and, on learning from Auricula growers that it was scarce, I purchased the stock; and, when the plants arrived, I was much struck with their perfume, which is stronger than that of any other variety of its family. It is a strong-growing free-blooming plant, the flower-stems of which are heavily covered with white powder. It is, in short, a good old-fashioned variety, which cannot fail to become a favourite, and is well worthy of pot culture. A compost in which such plants will succeed may consist of two parts of turfy loam from an old pasture, one part of thoroughly decayed cow manure, and one of coarse river sand and leaf mould. Such plants should at all times have plenty of air, even in winter when ever the weather is favourable.

H. CANNELL.



Woolwich.

PERENNIAL LARKSPURS.

WHEN in suitable soil, these throw up strong shoots and splendid spikes of flowers, which are remarkably showy during June, July, August, and September. The tallest are well adapted for forming back lines to mixed borders, while the dwarfer growing sorts come to the front, and, by judiciously arranging the colours, a pleasing effect may thus be obtained. Beds of Larkspurs are also very effective, the tall-growing sorts being in the middle and the dwarfer ones on the outside. They vary also in time of flowering, some being early, others late, and so a succession may be had through a considerable period. In height, Larkspurs vary from 1 to 6 feet, and the colours include bright scarlet, as in *Delphinium nudicaule*, pure white, pale lavender, and every shade of blue, from clear azure to deep indigo and almost black. Some have pure white, others brown and black centres. The flowers vary considerably in form and size, and the varieties include single, semi-double, and perfectly double imbricated flowers, and the flower-spikes vary in length from 1 to 3 feet. All are perfectly hardy, and may be cultivated in any ordinary garden soil. A deep, good loam suits the Larkspur well, especially if assisted by occasional dressings of manure and leaf soil, which should be placed on the beds as a top-dressing early in spring, and forked in during April. If I were preparing a piece of ground for a plantation of Larkspurs, I should deeply trench and well pulverise it, giving a good dressing of manure as the work proceeded; and, previous to planting, a good dressing of leaf mould, forked in and mixed with the top spit, would be of service. In the case of soils that are tenacious and wet, thorough drainage must be resorted to. Depth of soil is of great importance in the culture of the majority of herbaceous plants. If shallow, and lying on a hard sub-soil, their bloom will be comparatively poor and short-lived, especially in dry seasons and localities. Some recommend Larkspurs to be lifted annually; but if a top-dressing be supplied in spring, moving once in three or four years will be enough. The plants may be divided at lifting-time in order to increase the stock, but no roots should be divided till they are strong. If a few side shoots be taken away in the autumn, and potted in some fine, rich soil, and kept in a cold frame during winter, they will root readily; or if taken off early in spring and put into a slight bottom-heat, the cuttings soon make roots, and grow into plants that flower at midsummer or soon after. A few years ago the Royal Horticultural Society offered prizes at one of its provincial shows for Larkspurs in pots, and the result was satisfactory, and promised well for the future, but it was not repeated. These Larkspurs supply hues of blue not found in other plants, and when well grown have a good decorative effect. Quo.

Primula pulcherrima.—We saw this for the first time in the early part of last month, flowering profusely and vigorously on a piece of rock-work in the garden of Dr. Perceval Wright, Professor of Botany, Trin. Coll., Dub. The situation was by no means a good one, being

much exposed and shelterless; and yet this lovely species appeared quite at home, sending up its stout and stately flowers-stems (some six or more), each bearing a closely packed head of deep lavender-coloured flowers, with yellow centres. Individually the flowers are about the size of those of the Cowslip. At first the head flower is corymbose or flattish. The flowers in the centre are the first to expand, and as those surrounding it follow suite, the centre is thrown up, and the head assumes the form of a closely impacted globe, composed of innumerable flowerets. The flower-stems are some 6 or 7 inches high, tapering towards the top, and remarkable for their succulence and stoutness, and the profusion of farina with which they are dusted. Dr. Wright's plant commenced flowering early in March, first throwing up a bold central scape and flower head, which was followed by five or six secondary flower-stems. It is certainly a beautiful thing, and a real acquisition to the spring garden and lovers of spring flowers. As regards cultivation, it appears to be most accommodating. Perfectly hardy, all it requires is some loam and a well drained spot, such as a patch of rock-work or a dry border can afford it, to grow in. The succession of flowers and the length of time it continues in flower are not amongst the least of its recommendations. Messrs. Backhouse justly regard it as being perhaps the first of Himalayan Primulas of the denticula section. Its identification is not yet absolutely determined, and the present specific name is only provisional.—"Irish Farmers' Gazette."

Two Crops of Mimuli the same Year.—Mr. Clapham, of Scarborough, a most successful cultivator of the Mimulus, has worked up a very fine strain of the maculosus type, some of them unrivalled in character. He gets two crops or successive generations in one year, by treating them after the following fashion:—He first sows on or about the 1st of March, in a gentle heat; the seed soon germinates, the seedlings are pricked off into pans, about fifty plants in each, at one inch apart; the pans are placed in a cold frame, and the seedlings begin to flower in about twelve weeks from the sowing. As they flower the poor ones are weeded out and the good ones potted into thumb-pots and used for supplying pollen with which to fertilise other flowers or to bear seed. A sowing from this seed is made as early as possible after it has ripened—generally from the 4th to the 20th of July, and in the space of from eight to twelve weeks this batch of seedlings also blooms, and from the most promising flowers of this second generation of seedlings is obtained the supply of seed to sow the following spring. These easily-grown and handsome flowers should be more popular than they are.—"Florist."

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The White Silene (see p. 482).—Your correspondent's plant is, doubtless, *Silene alpestris*, one of the loveliest Alpines in cultivation, perfectly hardy and of easy growth everywhere.—THOS. WILLIAMS, *Ormskirk*.

Iris Kämpferi.—Of this beautiful Japanese Iris and its varieties there will soon be a fine display in Messrs. E. G. Henderson's Nursery, St. John's Wood. The plants form strong tufts in the open borders and have not been protected in any way; no doubt need, therefore, be entertained of their being perfectly hardy.

Thinning the Blossom Buds of Roses.—This is important, not only where fine blooms are required for exhibition, but also where a continual supply of cut blossoms is in request for room decoration. Our usual plan is to take off at least three-fourths of the buds when in a small state; and, thus relieved, the plants continue growing and blooming throughout the season without intermission.—E. HOBDAV, *Ramsey Abbey*.

Prince's Feather.—This well known hardy annual is deserving of more attention than it receives. It makes a striking centre for a large bed, and as a back row plant, in borders, it is equally effective. It may be sown any time in spring, either where it is required to flower, or in some place from which it can be afterwards transplanted. Unlike annuals generally, it is not liable to go off and leave an unsightly blank before the end of the season.—E. HOBDAV, *Ramsey Abbey*.

Meconopsis Wallichii.—Mr. Williams (see p. 498) is quite right regarding the colour of *Meconopsis Wallichii*. It is the *M. nepalensis* of De Candolle that is of a yellow colour. The yellow species, also called *M. paniculata* by Don, I have never seen in cultivation, nor yet the *M. Wallichii* till last year. It has not yet flowered here. In colour the figure is of a light azure blue, not much inferior to that of the *M. aculeata*, which is truly a magnificent rock plant. The plants of *M. Wallichii* are covered with beautiful yellow silken hairs.—J. McNAB.

A Blue Asphodel.—Can any reader tell me what is the flower alluded to in the following passage from Mr. Ruskin's "Proserpina," Part I., p. 12:—"Rome, 10th May.—I found the loveliest blue Asphodel I ever saw in my life yesterday, in the fields beyond Monte Mario—a spire 2 feet high, of more than 200 stars—the stalks of them all deep blue, as well as the flowers. Heaven send all honest people the gathering of the like in Elysian fields some day!" I have never, as far as I can remember, seen such a plant in cultivation.—THYMUS.

Seed apparently without Flowers.—The production of seed without apparent flowers, as mentioned by Mr. Ware in last week's issue, in reference to *Viola pinnata*, is by no means an uncommon occurrence, particularly in the genus *Viola*; but flowers are there, though much reduced in size, and often altogether destitute of petals. In the common sweet Violet, the conspicuous flowers produce little, if any, seed, whereas the small apetalous flowers borne later in the season are exceedingly prolific. I may add that the true *pinnata* is a South European species, whilst *palmata* and *pedata* are North American kinds.—W. N. H.

JAPANESE MODE OF PACKING PLANTS.

MR. ANDREW MURRAY read a paper on this subject at a recent meeting of the Scientific Committee of the Royal Horticultural Society:—"I have been," he says, "led to bring the subject under your consideration by finding that the mode of packing for transport adopted in Japan is different from ours, and as it is successful, it appears to me desirable that we should examine it with a view of ascertaining whether it embodies any hint that may be adopted with advantage by ourselves. I am not at all challenging the excellence of our present practice. All that I say is, that if it can be improved we should try to do it. I have seen a bundle of plants a fortnight on the way arrive not much the worse, but I have also seen them arrive utterly destroyed, and I presume all nurserymen must be familiar with reclamations from their customers for injury sustained by these packages not being delivered in time. Now if by any new plan we could make them keep for twice as long uninjured I imagine it would be a great boon to these gentlemen. This is what the Japanese do, and their process is to shake the earth entirely from the roots of the plants, and then to envelope them carefully in a kind of stuff seemingly a mixture of dust, saw-dust, fibres, and *débris*, of which I exhibit a portion, and which keeps the roots from injury and from the air during the transit. The way in which I happen to know about it is this:—I have a brother in San Francisco who, as perhaps some of the committee know, is something of a horticulturist. Last season he imported some young living plants of certain species of forest trees from Japan. They arrived in perfect health, packed in the material I have just shown. Struck by the success of the plan, he immediately re-packed a portion of the parcel and despatched it to my sister in Edinburgh. When they reached her most of them were unmistakeably dead, but some two or three still showed signs of life, and it is only now, some months subsequently, that she has given up all hope of bringing them through. They also are dead. Now the committee will remember that the distance from Yokohama to San Francisco is 5,573 miles, which at the rate of 300 miles a day, is about equal to twenty days. The breadth of the Atlantic between New York and Liverpool is only 3,080 miles, and including the transit across the continent from San Francisco takes twenty-three days. The plants thus kept well for twenty days, and if they had remained unpacked there seems no reason to doubt that they might have done so for some days longer. Nurserymen will be able to say how far the degree of success here indicated is worth pursuing and experimenting upon. Our business, I apprehend, is rather to look at the physiological principles required for success, and say which plan seems best to accord with them. The Japanese and European cultivators both start from the same point, viz., shaking the earth from the roots. This, undoubtedly, is sound. There is nothing equal to earth for growing plants in, nothing worse for transporting them in. I do not speak of transplanting with a ball of earth or in earth still attached to the roots. The object of that is to prevent disturbance, breakage, and exposure, and where plants can be transported to their destined place of growth so protected, whether with a bound-up ball of earth or in a flower-pot, no one would propose to improve upon it by shaking off the earth, but where they are to travel not so protected, and for such a distance or time that the earth will dry up and crumble and break away, it can serve no purpose but to injure the more delicate parts of the roots by rubbing against them. It is in the next stage that the difference between the Japanese and European packing takes place. The European ties the roots up tightly, puts moss about them (often moistened with water), and then wraps them up carefully with matting. The Japanese handles the roots more gently, fills up the interstices with his padding, and then covers them with matting. I do not know for certain whether he moistens his padding at starting or not—I believe not. There is no appearance of it ever having been wet—no adhesion—no portions sticking together, and I apprehend that the more correct and better plan in all cases, except where we can calculate on the plants arriving before the moisture has evaporated, is to give no moisture. Moisture about the roots is not an absolute requisite for the survival of plants. In dry summers we have plants living with the earth about their roots as dry as a bone for a foot down. It is the exposure to the air that does the mischief—not the want of water. Every cultivator knows that a plant left with its roots bare will sustain more damage in a couple of hours than another with them covered will in a week. The great secret of successful transmission of plants with the roots out of the earth is the exclusion of air. [The merits of this plan might be easily tested, and we should be glad, about a month hence, to receive from some of our correspondents who may try it, an account of the result. All that has to be done is to take up two or more plants of the same kind, and of equal size and health, and pack one up in the usual English fashion, and the other in the Japanese way, using dry Cocoa-nut refuse for the padding; then put both aside, and see which lives the longest.]

THE INDOOR GARDEN.

RAISING NEW CHINESE AZALEAS.*

By MARSHALL P. WILDER.

MUCH complaint exists among botanists in regard to the hybridisation of plants, as causing confusion—breaking up natural divisions by crossing the species—but, for my own part, I think that instead of confusing the labours of the botanist it has been the means of more clearly defining these divisions, and has given to the world thousands upon thousands of plants far more beautiful and useful than the types from which they were produced. The production of new varieties by the artificial crossing of flowers, by which we can blend the best characteristics of each, affords a source of pleasure and interest to which there are no bounds. Although the art of producing new varieties in this way is of comparatively modern origin, it has now become the acknowledged source of improvement, and the best means for the acquisition of new and improved varieties, upon which we are to rely in future for perfection in the vegetable kingdom. This has been my conviction for forty years, and it has influenced me in practising this art. It is only about thirty years since much attention has been given to the production of new varieties of the Azalea. But those originated within the last twenty years may now be numbered by thousands; one of my friends in Belgium having produced more than six hundred named kinds. Belgium, Germany, and England, have given more attention to the production of new varieties than all the rest of the world. And never before has there been more interest or enterprise in this line of cultivation. Every year brings us something desirable, and now that the Japanese Azaleas (*A. mollis*) are coming to our aid, we may expect even finer results than before. It is quite probable that, by the intermixture of the Chinese and this new hardy species, we may obtain varieties with persistent foliage. These Japan varieties are believed to be hardy; a plant in the Cambridge Botanic Garden, raised from Japan seed, having stood entirely uninjured for several years without protection. The Chinese varieties are easily crossed by the pollen of the Japan sorts, and I have now a pan of young plants just coming up, which are the result of hybridisations made last spring, between *Azalea indica* and *A. mollis*. New varieties are raised by the cross-

fertilisation of flowers, which produce an abundance of seed. The seed vegetates freely, and with good care will produce fine little plants that in two or three years may be made to bloom, and thus give us early the results of our efforts. The plants which I hold in my hand [Mr Wilder here exhibited two seedlings which were acknowledged by all to be of remarkable size for their age], are the result of seeds produced by the *Souvenir de Prince Albert* fertilised with the pollen of various other kinds. The seed was sown last winter, and came up in March or April. These plants, as they stand, measure more than a foot in height, and I expect to have them in flower next year. To accomplish this, I shall either take off the tops, and graft them on strong stocks, or, what is surer, inarch the

tops on to strong stocks. The process of grafting may be either by split grafting or by a side graft, but in these cases the plants should be laid on their sides in a close frame and in very mild heat; or they can be worked by standing the stock upright, and slipping over the whole a common glass lamp chimney, stuffing the top with cotton, so as to keep the air close and the graft fresh until a union has taken place, and the graft begins to grow. This is called the "stified graft," and was introduced to me thirty-five years ago by the Chevalier Soulange Bodin, for the propagation of *Camellias*, *Azaleas*, and other hard-wooded plants. The *Azalea phœnicea* has been found to be one of the very best for stocks. Cuttings are made of half-ripened wood, cut smoothly, just below a leaf-bud. They may be planted in pans or pots, very thoroughly drained with broken pots, on which should be a covering of Moss, or spent Hops, which I have found to be excellent for drainage. For soil we use two-thirds



Aralia Guilfoylei (see p. 506).

peat and one-third fine white sand, but they will do equally well in sand alone. As regards temperature, cuttings of the *Azalea* will root in a shady, cool place in the greenhouse. This is, however, a slow process, and the better way is to cover the pots with bell-glasses, or, which is still better, to place them in a bed with a mild heat. In this way cuttings root very freely, and in two years, with good care, will make pretty blooming plants. In the production of new varieties, if you desire white varieties, use white sorts to cross with; if red, then use red; if variegated sorts are desired then impregnate with the pollen of striped or spotted sorts. For this purpose I use a small camel's-hair pencil, which I have always in my pocket, taking the pollen from one flower and transferring it to another. The proper time to fertilise the *Azalea* is about three days after the flower is

* Read before the Massachusetts Horticultural Society.

open. At this time the stigma will be well developed, and in such a state as to receive the pollen readily, and before the stigma becomes too glutinous. But we desire to go farther than merely obtaining beautiful varieties, and to make the Azalea hardy, so as to stand the open air like the deciduous species, and this I deem quite possible with the varieties which we shall obtain from the crosses of the Japan species. The white Chinese Azalea is nearly hardy in England, and has stood in some places for many years without protection. A cross with this and the Japan species would give hopes of success. Although I have spoken of hybridisation as the means of producing new varieties no plant is more given to what is called sporting than the Azalea. Some of the very best varieties we have owe their origin to a freak of Nature; that is, to flowers which have departed from the natural type and given flowers of other colours. To these we have given the name of sports. They are perpetuated by grafting from the sporting branch. The seed is gathered in October or November and kept until January, when it is sown in shallow pans in two-thirds peat and one-third fine sand. When the young plants have attained the height of 2 inches they should be potted off into thumb-pots and placed in a bed of tan or similar substance, where the bottom of the pot will not dry suddenly, near the glass in the shady part of a pit or greenhouse. These pots, as well as those afterwards used, should be most thoroughly drained. In the treatment of established plants I have drained with potsherds, with a covering of Moss or spent Hops, so that the plants might take a full supply of water without the earth becoming sodden and sour. The plants should, at all times, have a regular supply of water, especially when in flower and while making their growth. I have found that it is well to keep them in the greenhouse until the weather becomes warm outside, so that they may ripen their wood thoroughly. They should then be removed to a cool shady place; or, if allowed to receive the sun in the middle of the day, they should be plunged in some substance so as to prevent the roots from becoming injured by the heat of the sun on the pots. Mr. Hunnewell's method is to pile soil around each separate pot, and I have never seen any Azaleas in better condition than his. The best season for potting is immediately after the plants have made their growth in the spring, and the best soil is three parts fine old peat and one part fine sand. The Azalea may be forced early, and a succession of flowers may be had from December to May if kept in a cool house until wanted for forcing. One word in regard to the form of plants. A natural form, grace, and beauty, has been given to every species of plant, and our treatment of them should correspond with that rule of beauty which has been given for our guide. True, there are from some cause often naturally ill-formed plants, but these are exceptions to the general rule. In a word, I am not in favour of the modern method of training and tying down the branches to make exact spherical, conical, or other geometrical forms. Such are not the natural forms, and I think we should follow Nature as closely as we can in the training and pruning of the Azalea, only early removing such gross or rambling branches as are necessary to keep the plant within proper bounds. This training of Azaleas into geometrical or fantastic forms is just as unnatural as to train an American Elm into a pyramid or a Norway Spruce into a standard with a high stem and a globular head. Nothing in the way of ornamental plants under glass can surpass the gorgeousness of the Azalea, with its rich and varied colours, and it is not probable or perhaps possible that any plant will ever exceed it in beauty. A large conservatory full of these plants, when in full bloom, may be truly described as effulgent with beauty and glory.

In the discussion which followed the reading of this paper Mr. Charles M. Hovey said that the Azalea had long been a pet of his, and Colonel Wilder had given us a fresh reminder of its beauty. Mr. Hovey was one of the first to raise new varieties from seed, having, in 1837 or 1838, sown a large quantity, and produced a great many fine seedlings, among them a white variety which he named *alba crispiflora*, and which he thought scarcely surpassed. Some of the plants then raised are now large specimens. Fine large plants can only be obtained by grafting. He agreed with Colonel Wilder that the formal training practised by some cultivators is unnatural. Still, to produce a well-shaped bush one cannot dispense with pruning, and the best-formed specimens are made by a combination of tying and pruning. Grafting must be done when the wood is comparatively soft; he had inserted thirty, forty, or fifty grafts on a single plant. Some of these will not be in the right place, and will require tying to a certain extent, in order to have the wood equally distributed. The production of new seedling varieties is of great importance. By hybridising with *Azalea amœna* a hardy race might be got better perhaps than from *A. mollis*, and also an ever-green one, which would be desirable. We cannot do much with *A. ovata*, though a beautiful species and probably hardy. Like all plants of the Heath family, Azaleas require some pro-

tection. No plants are so quickly injured in the buds by frost; an early frost before the plants were housed, which did not destroy the *Heliotrope*, injured every flower-bud of the Azaleas, though the foliage was not touched. The terminal leaves hold the moisture from the dew around the buds. The point we should aim at in raising seedlings is to get a variety with good flower, foliage, habit, &c. Many varieties, when in bloom, are so densely covered with flowers that it is of no consequence that they have no foliage. The plants may be frozen without injury, if kept dry; but, if wet, the flower-buds are destroyed. In answer to an inquiry as to the process of grafting, Mr. Hovey said that he takes off the end of a shoot, pares off one side of both scion and stock, and ties on as a side graft. The plant is then laid on its side and covered with a newspaper, or placed in a frame, when, if kept close and warm, they unite and may be removed in six or eight weeks to the house. Grafting, Mr. Hovey said, can be done at any time; but from the 20th of July to the 1st of September is best. The seed is remarkably fine, and should be sown in sandy loam or sandy peat, with a little of the same over it. It should be protected with a glass laid over the pan, and watered very cautiously. Worms are apt to trouble the seedlings. As soon as they are large enough to handle, they should be pricked out in boxes a foot square, about fifty in a box. On the 1st of June they should be potted and put under a whitewashed frame. Mr. Wilder said that his method was to sow the seed in broad pans in January or February, and pot when the plants are 2 inches high, in pots one-third full of drainage. He had petted his plants, which would perhaps account for the size of those exhibited.

ARALIA GUILFOYLEI.

This fine ornamental stove plant is a native of the South Sea Islands. It is of shrubby habit, and has an erect stem, copiously dotted with lenticular markings. The leaves, which are pinnate, have smooth terete petioles, and, in the case of young plants, are made up of from three to seven-stalked, oblong-bluntish leaflets, which are sometimes obscurely lobed, and irregularly serrate; these leaflets vary in length from 2 to 3 inches, and are neatly and evenly margined with creamy-white, the surface being in addition occasionally splashed with grey. The annexed illustration (see p. 505) represents a plant of it as seen in Mr. Bull's establishment in the King's Road. It grows very freely in a fresh open compost of peat, loam, leaf mould, and sand, and enjoys the temperature of a warm moist plant stove. Wherever variegated-foliage plants are appreciated this cannot fail to be a favourite.

B.

LILY FORCING.

AMERICANS usually import Lilies from Germany in the autumn, and care should always be taken to select from among them such as are strong and well-ripened for forcing; for upon this success greatly depends. Early in November a number of shallow boxes or flats, about 4 inches deep, are prepared. In these the bulbs are planted as thickly as they will stand. They are then watered freely and placed out of doors in an open position, exposed to all kinds of weather. About the 1st of December they are usually placed in a warm house—that devoted to *Poinsettias* is the best—the boxes being placed on the top of the hot-water pipes. They are then covered 2 inches deep with Swamp Moss, such as is used for packing plants, and are kept well supplied with moisture by sprinkling them two or three times a day with water. As soon as the young plants show their flower-stems, they are removed to a part of the house where there is more light, but, as yet, they are not exposed to the rays of the sun. When they are removed from their position upon the pipes—these being under the benches—the leaves are white and blanched, and, consequently, care must be taken that they are gradually inured to light. After this the leaves will become perfectly green, whilst the flower-stems become erect and the flowers well developed, the latter being marketable at Christmas and New Year, and bring from £2 to £3 per 100. Succession crops are introduced during the winter in order to supply the demand which exists for these flowers, and which, in New York and Boston, is greater than the supply. Mr. Wilson, Astoria, Long Island, imported 200,000 last winter. When the bulbs have finished flowering they had better be thrown away; they are worthless for any purpose.

JOHN HOWATT.

Aspect and Elevation of Hothouses.—In the case of houses intended for early forcing, we are almost sure to give them a full south aspect and a sharply-inclined roof; flat houses, for successional work, with any other aspect, being the exception. My own impression, however, is that more skill is necessary to have at all times

enough of everything than to have any given crop fit for use at a certain date, possibly at the risk of having a deficiency of the same kind of produce a month later. It therefore becomes important to have succession houses as well as houses for early forcing. A moderately low-roofed house does not require more than half the amount of ventilation that a steep-roofed one does to keep the temperature at its proper level. I am no advocate for shading fruits of any kind; but I have heard of forcing houses being, what is termed, "improved," until even tropical fruits need shade. Architects recommend lofty buildings, and, as a rule, make provision for plenty of light and heat; but, in practice, large houses are found to be unfavourable to the growth of plants. Gardening becomes poor, indeed, when the houses, and not their occupants, form the chief attraction; and that the best results can be achieved in houses comparatively small in size, I am confident from my own experience.—JAMES GROOM, *Henham, Suffolk*.

Glazing with Tile-shaped Glass.—In his account of the flower show held in Paris the other day, your correspondent has omitted what, to my mind, was the most useful novelty exhibited. This was a common iron sash glazed with concave panes of glass; these carry off the rain and melting snow like so many gutters, preventing any filtration of wet into the putty and iron work. The price is the same as that of flat glass, a very slight modification only in the manufacturing of it being required. The white hot cylinders, when split and allowed to fall open upon a flat iron table form flat panes; but, in the case of concave glass, for the flat surface is substituted one of the required convex curve, and the panes take the required shape of themselves. The lowest pane is so raised by putty or lead as to lie properly on the flat transverse bar or edge of the sash. Perhaps if this lower bar were placed on edge and bevelled out at the top to suit the shape of the pane it might be an improvement.—F. T. P.

Very Doubtful.—A novel cure for sickly pot plants is given by M. Willermoz, in the "*Bulletin de la Société Horticole de Soissons*." He states:—Many growers are ignorant of the fact that pot-plants which have become sickly through over-watering, planting too deeply, &c., may be greatly benefited by giving them water at a temperature of 133° to 144° Fahr. For some years past M. Lucas, of Hohenheim, has pursued this method, instead of changing the soil, and he assures us that it never fails. Amongst plants so treated he mentions Palms, Roses, *Ficus elastica*, and others. The soil should be well stirred, and soaked with water heated to a temperature of 133° to 144° Fahr., until the latter runs off freely from the bottom of the pots. After a few days the sickly plants recover their original look of health and vigour, and begin to grow again. It is noticed that the earth becomes much more friable after this treatment, and, when dry, has all the appearance of fresh soil.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Two-spathed Flamingo Plant.—I flowered some seedlings of this plant for the first time last year, and the first that opened its spathe proved double, and much more perfectly so than that of which you have given an engraving at p. 481, inasmuch as the second spathe was all but as large as the first, and both were large for a young plant. I looked forward to the opening of the next spathe on this plant, hoping that double spathe were to be a permanent characteristic of it; but I was disappointed. It has come single ever since, and I expect that Mr. Gumbleton will find that his will do the same.—W. THOMSON, *Clovenfords*.

The White African Lily (*Agapanthus umbellatus albus*).—This is perfectly hardy, and exactly resembles *umbellatus*, except that its flowers are delicate paper-white instead of blue. In pots it is useful for conservatory decoration, and it is also valuable for cutting, as its flowers look pretty and distinct in bouquets and button-holes.—B.

Plants for Window Boxes.—The following succeed well with me in an eastern aspect:—Canary Creeper, Crimson and white-flowered Daisies (now very effective), common Stonecrop (*Sedum acre*), *Rhodeola rosea*, a very pretty glaucous-leaved succulent plant which comes up clean and fresh every spring. Scarlet and yellow-flowered *Tropæolums* are also very showy, and the foliage is always of a bright green tint. *Cobæa scandens*, planted out a month ago, is growing very rapidly, as also is the Virginian Creeper.—B.

Cool Treatment of Orchids in Winter.—I have been subjecting my Orchids, especially Vandas, to a very low temperature in winter, and I imagine more healthy or vigorous plants do not exist anywhere. I showed a spike of *V. suavis*, the other day, at South Kensington, with nineteen blooms on it. I had a plant photographed, to show how finely they keep their foliage to the bottom, and to indicate how strongly the leaves grow. Mr. McMoreland called here last autumn, and told my son that he never saw Vandas so robust as mine were, and all Orchid growers will agree that he is a good judge.—W. THOMSON, *Clovenfords*.

Venus's Fly-trap (*Dionæa muscipula*).—This interesting little plant is just now producing its pure white Primrose-shaped flowers on pale green scapes about a foot in height in abundance in the Wellington Nurseries. Potted in fibrous peat and fresh Sphagnum Moss, it is one of the easiest of plants to cultivate, but likes a warm and moist temperature with plenty of air. If the atmosphere of the house is dry a bell-glass must be placed over it to induce it to grow freely. I saw hundreds of fresh little specimens the other day in the nurseries just named growing close under the glass in a warm greenhouse, and, wherever the wall on which they were standing was naturally moist, there the plants were in better health than those in dry places.—B.

THE KITCHEN GARDEN.

POTATO-CULTURE AT KILLERTON.

As this is the season for earthing-up Potatoes, a description of the mode of culture that I have for several years practised with success may be useful. The ground in winter is well prepared by being dug up in ridges and exposed to frost. About Lady-day, I have it forked down, spread manure on the surface, and then plough in the Potatoes 6 or 7 inches deep and 2 to 2½ feet apart. When they begin to break the ground I harrow them over with a pair of very light harrows on a sunny day, which kills all the small weeds. When about 8 or 9 inches high they are hand-hoed, and then require no further attention till they are dug up the first or second week in August. Last year I began to dig them on the 29th July, as the Regents had begun to grow out. In digging, they all hang to their haulms, and considerable caution must be exercised in handling them, in order that they may not be bruised. They should then be put in a long narrow heap, and covered with dry litter or Fern, thatched with "reed" or prepared straw to keep them dry. This straw is similar to that used in this neighbourhood for the roofs of cottages and other buildings. The straw for making reed is thrashed and combed by hand. In a fortnight or three weeks they should be looked at, to ascertain if any are diseased; and, if this is not the case, they should be gradually earthed up, the ridge being left unearthed to prevent them heating. Last year I had some under a north wall which were not picked over until Christmas, when they were removed to the lime and sand floor of a dark cool cellar, where they keep much better after the end of the year than in ridges or caves out of doors. The disadvantage of earthing up is that the first leaves are buried, and a fortnight of the short season before the disease sets is lost, which must be taken into consideration. I believe the crop is no heavier for earthing, and the practice entails much extra labour at a very busy time. My remarks apply to good, well-drained ground—in wet soils earthing may be advisable. I find that the true Lapstone Kidney is one of the best kinds, and it does not run out if grown in the same ground; I have grown it here for seventeen years. Carter's Ash-top Fluke, I consider, is the same sort grown side by side here. York Regent is one of the best late Round kinds. With me it is a heavier cropper than Paterson's Victoria, and more free from disease—both are excellent in quality, but the latter is better for cropping between, as the haulm is erect in its habit. The York Regent soon runs out, or degenerates, if grown year after year on the same ground; but on planting fresh seed it produces, with good cultivation, very heavy crops. Although the tubers readily skin, and appear very unripe when taken up, the quality is excellent afterwards throughout the whole season. Many of the cottagers in this neighbourhood have followed my advice in reference to Potato-growing, and have, I believe, found the advantage of doing so.

JOHN GARLAND.

Killerton, Exeter.

New American Potatoes.—Like your correspondent "J. T." (p. 491), I purchased 2 pounds of the new American Potato Snowflake, and 1 pound, containing three tubers, I cut into twenty-five sets, that being the number of eyes on them, and, after drying these in sand for a few days, each set was planted in a small pot and placed in a cold frame to sprout. They have since been planted out; and, although touched a little by a slight frost on the morning of the 30th of May, they are growing vigorously. No signs of any curl on the foliage have yet been perceived on any of the plants like that mentioned by "J. T." as having attacked his plants. The other pound of Snowflake also consisted of three tubers, and I cut them into thirteen strong sets and planted them out at once in a row. The plants now are very vigorous, but show no symptoms of curl in the leaf. The dwarf foliage of Snowflake and the colour of the flower are of the Early Rose type, and they are exactly similar in foliage and flavour to plants of the Wild Potato I once raised from Peruvian or Chilian seeds. The Chili Garnet, a variety of Wild Potato, is, I believe, the parent of the Early Rose, from which all the other new American kinds have sprung. With me the variety named Brownell's or Vermont Beauty is the strongest grower of the newer kinds, and the tubers are large and fine-shaped, and do not, when cooked, possess so much of the peculiar early flavour as is the case with the Early Rose and others on some soils.—WILLIAM TILLERY, *Welbeck*.

Picking off Potato Blossoms.—I observe some discussion in the papers on the practical utility of picking the blossoms off growing Potato plants to increase the growth of the tubers. According to theory, this would be the result, the formation of seed always tending to exhaust more or less the vitality of the plant. Many years ago, we were told that the crop would be increased one-third by carefully removing all the blossoms. I gave it a careful test in rows side by side, but ordinary measuring did not indicate the slightest difference.—A.

THE FRUIT GARDEN.

RIPE AND UNRIPE GRAPES.

I LATELY saw a Vine, on a portion of which the fruit was ripe; while, on the rest of it, the bunches were only just formed. This was caused by the longest rods being taken from a cold house into a Pine stove, through an aperture in the divisional wall. The growth was extremely vigorous, the bunches fine and evenly swelled; and the circumstance was not thought at all strange, but it was considered that, if all the rods were in different temperatures, as good a succession of Grapes might be obtained as if separate Vines were employed. This seems feasible enough, if we disregard the roots, and imagine the supply of sap to be as much under our control as that of water in pipes of different kinds. We can form a tolerably correct idea of how far organisable sap will maintain growth by watching that of a freshly-planted deciduous tree. It will start apparently as strongly as if the roots had been undisturbed, but will suddenly come to a standstill, and, in that condition, have to wait until fresh roots are formed to enable it to make further progress. In the case of the Vine, however, the growth was carried on apparently without any check, for, by the time the organisable matter in its different rods had become exhausted, the roots were ready to maintain growth, and doubtless did so.

J. GROOM.

LATE-KEEPING APPLES.

THE summer and autumn of 1874 were so dry and warm, that they had the effect of ripening the late varieties of dessert and kitchen Apples better than has been the case for many years past. The soil in the kitchen garden here is of a very adhesive nature, with a red clay sub-soil, so that in wet cold summers and autumns Apples never ripen properly so as to keep well. I have, however, now in the fruit-room the following varieties of dessert Apples, all good-sized specimens and well coloured, namely:—Court-Pendu-Plat, Old Nonpareil, Fearn's Pippin, Golden Harvey, Keddeston Pippin, a delicious little Apple; Lamb Abbey Pearmain, one of the very latest keepers; Reinette van Mons and Reinette du Canada, both very large and good late dessert kinds; and Sturmer Pippin, which is one of the most valuable late Apples that can be planted, both for flavour and for being a sure bearer. The Calville Blanche, from small horizontal cordons planted on the bottom of an east wall, is another delicious Apple here, and keeps well; it is likewise one of the very best to be eaten by invalids, as it is one of the most melting kinds known. Of kitchen Apples, the kinds which are in best condition here, in the same fruit-room with the above, are the following, namely:—The Alfriston, a valuable large Apple, and very productive; this sort and the French Crab can be kept in a good fruit-room for two years without the fruit shrivelling much; the Brabant Bellefleur, another large and good-keeping kind; and Dumelow's Seedling, or Wellington, an excellent sauce Apple, with a brisk acid flavour. The Bess Pool is a finely-coloured sort and late keeper, but the tree is only a shy bearer. The Bedfordshire Foundling and Rymer are both excellent late keepers; and Allen's Everlasting is the latest keeper of all and is like the Sturmer Pippin in shape and flavour. In the above list of late dessert and kitchen Apples, I believe there will be found as good a selection as can be planted, where very late-keeping varieties are desired. In planting new orchards, too many of the early and mid-season sorts of Apples are in general planted, and there is produced a glut of fruit that will not keep, and which is not nearly so valuable for use or for market, as the late-keeping kinds.—WILLIAM TILLERY, in "Florist."

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Souvenir du Congrès Pear.—Those who like Pears with a musky flavour, like William's Bon Chrétien, may note that this Pear has already obtained much praise, both on the Continent and in America. It is one of the largest of the dessert Pears.

Plants for the Back Wall of a Cool Vinery (H. L. B.).—You do not say whether frost is excluded or not. If frost is kept out, Camellias, Oranges, white Brugmansias, and the blue Plumbago capensis, are as good plants as any for such a situation.—R. G.

Ficus Parcellii.—A small plant of this, growing in a 4-inch pot, showed three fruit, but two dropped off. There is now one fine fruit measuring seven-eighths of an inch in diameter, with a foot-stalk half an inch in length. The variegation of the fruit is in stripes of green and white. Has this plant ever fruited in this country before?—RICHARD NISBET. [A plant of it bearing fruit was shown at the last Crystal Palace exhibition by Mr. B. S. Williams, of Holloway.]

Young Chaffinches and the Gooseberry Grub.—That excellent observer, Mr. Doubleday, of Epping, informs me that a brood of young chaffinches will soon clear a Gooseberry bush from grubs. It is, therefore, the interest of gardeners to encourage chaffinches in the breeding season, instead of taking so much trouble to destroy them or frighten them away.—EDWARD NEWMAN, in "Field."

CUPRESSUS LAWSONIANA.

TWENTY years have elapsed since this Cypress was introduced into this country. The horticultural and arboricultural world has had full time to make up its mind as to its merits, and we presume there will be little dissent if we call it the Queen of the Cupresses, and place it at the head of all those that are cultivated in the open air in this country. It has a grace and elegance peculiar to itself; it is perfectly hardy everywhere throughout Britain, has a flower to which none of the others approach in beauty or brilliancy, bears seed freely, and, besides all this, grows to be a large tree, and furnishes valuable timber. It was first described and figured by Mr. Andrew Murray, in 1855, from specimens that had been forwarded to him by his brother, Mr. William Murray, of San Francisco, being part of the produce of an expedition he had made to Scott's Mountain, in the north of California, where he found the tree growing over a waterfall, and described it as the finest and most elegant tree he met with in his whole expedition. Unfortunately, on that occasion, the trees he saw were not bearing much fruit, and only a few seeds accompanied the specimens. These were handed to Mr. Charles Lawson, of Edinburgh, after whom the species was named. From these seeds a few plants were reared, which are still growing in the Lawson Company's nursery at Edinburgh, and are the oldest trees of this Cypress in Europe. Its value was at once recognised; and Mr. William Murray made a second expedition for the express purpose of obtaining a good supply of its seeds. A tolerable quantity was procured, which was disposed of to Mr. Waterer, of Knap Hill; and from that source the great proportion of the trees of any size now growing in Britain have been raised. Subsequently, large importations of seed, from various sources, have been received in Britain; and, as the seed grows readily, there has been no need to resort to the practice of multiplying the species by cuttings or grafts, so that those who possess this beautiful species may, in almost every instance, rest satisfied that their plants are seedlings and not worked plants. At the time when this Cypress was described, nothing was known of its flower. Naturally, when people go seed-collecting, they prefer the autumn, when a better harvest awaits their labours than if they went in spring; consequently the flower not having been found could not be described. But the flowers of other Cupresses being all of one type, it was naturally thought that it would not differ materially from them. They have all a small insignificant flower of a dirty drab colour, and it never occurred to anyone that a species might exist which had a flower the colour of a soldier's coat. Such has turned out to be the case, however. Curiously enough, its first flowering occurred on a somewhat interesting occasion. Our readers may remember that a few years before his death Lord Palmerston paid a visit to Edinburgh. At that time Mr. Charles Lawson was Lord Provost of that city, and he would have been less a man of business than he was had he not seized the opportunity to take the Prime Minister over his nursery. Many were the novelties and rarities he had to display, but none of them were more beautiful, or interested Lord Palmerston more, than this Cypress the first raised plants of which had that very morning burst for the first time into bloom. Those of our readers who have not seen it may judge of its beauty from the accompanying plate. A few years after the introduction of this species, Dr. Kellogg, of San Francisco, described, under the name of Cupressus fragrans, another species, which he considered to be very close to, but distinct from, Cupressus Lawsoniana. This he obtained from near Port Orford, in Oregon, where it grows in abundance, and where it is known by the local name of the Port Orford Cedar (Cedar being, as our readers know, the American appellation for Cypress and Juniper). A plank of this Port Orford Cedar was at that time exhibited in San Francisco as a curiosity for its beauty. By-and-by seeds of authentic specimens of Prof. Kellogg's Cupressus fragrans were received in this country; but, when they came up, our botanists were unable to discover any difference between it and Cupressus Lawsoniana either in foliage or fragrance; still, as Prof. Kellogg was known to be an excellent botanist, they reserved their judgment until they should see its flower and fruit. Of course some years elapsed before this took place, but "time and the

hour wear out the longest day," and at length it flowered, first in the garden of Mr. Isaac Anderson Henry, near Edinburgh, and when the flower was seen it was thought to settle the matter in favour of Dr. Kellogg's *C. fragrans* being a distinct species, for it was yellow instead of scarlet. Botanists accepted the situation and admitted the species; but, ere long, a new change came over the spirit of their dream—other plants of *Cupressus Lawsoniana*, as to whose specific identity there was no doubt, began to flower, and it was then discovered that their colour was not constant, some plants bearing scarlet flowers and others yellow. There thus now seems no reason to doubt that Dr. Kellogg's species is identical with *C. Lawsoniana*, and the explanation of his error has been found in the extreme variability of *C. Lawsoniana* within certain bounds. Not only do the flowers differ in colour in different individuals, as we have described, but the growth, habit, and colour of foliage also vary in a remarkable degree. We believe that no seed bed of this species has ever yet been made which did not produce a number of notable varieties. Many of these have been picked out by nurserymen, and have been propagated by grafting and cuttings and widely distributed. We have golden variegations and silver variegations of several degrees; we have some kinds glaucous, and others green; some so mealy as to appear all frosted with silver or hoar-frost; others almost entirely destitute of this mealiness. Generally the habit of the branches is drooping, but some have been found growing as straight and narrow as an Irish Yew, others wide and spreading, but all bearing one common stamp, which prevents anyone doubting the species to which they belong. Specimen plants of this species have already reached considerable dimensions in Britain, and these show that, on the whole, its habit is close and spiry. It should reach 60 feet in height, and already we have plants of it upwards of 20 feet.

ANDREW MURRAY.

SAVANTS AND BOTANY.

A BRISK shower having driven me in from the garden, I sit me down quietly then in my study, and amuse myself with a species as curious as any of those we shall have opportunities of observing in either your voyage or mine. I propose saying a little about savants. You cannot but remember that smiling portion of your life, full of gaiety, sports, and affections—I mean childhood; that childhood always too soon given up to pedants, who aggravate children for ten years, in order to render them aggravating for the rest of their lives. Represent to yourself one of our school play-hours: all those open, ingenuous, cheerful countenances; these engaged in running and jumping, those with their kites, others in throwing and catching balls, and others, again, skilfully striking marbles with other marbles from a great distance. Recreation is the true education that belongs to this age; by it we become healthy, vigorous, active, and brave. But the fatal hour has struck. A man, with black clothes and a yellow visage, appears in the court. Everything becomes silent, everything stops, everything is sad. The sports of boyhood must all cease. And why? No doubt, for the sake of learning a trade, an occupation; to assure beforehand the independence of the whole of their lives. Not at all. There are amusements for a riper age as well as for childhood. Youth has no amusements; it despises them, it does not want them—it requires happiness. Childhood in no wise desires other ages to partake of its amusements. Youth would be furious if others wished to take away a portion of its felicity. But mature age insists upon having partakers of its amusements; which arises from the circumstance of these amusements being very tiresome. In fact, these said amusements consist in nothing but reading and re-reading, for the hundredth time, the same Latin and Greek books. For my part, I cannot see why each age should not be left in the free enjoyment of its own pleasures, or why children should be tormented during the whole of their joyous age, by being taught a game which may amuse them at an age they are not certain of attaining. I cannot see why they should be forced to admire what they don't understand; why an entirely literary education should be given to people who are destined to be dispersed through all the conditions of human life; or why literary studies should be confined, during ten years, to the learning of the only two languages that are never spoken. Jean Jacques Rousseau knew but very little Latin. I have no need to tell you why Homer did not understand Latin at all. That which savants do with regard to children, they do with regard to everything they come near. They render everything wearisome, dry, stiff, and pretentious. They cannot leave flowers

alone—they put them in starch. See a savant enter a smiling meadow or a perfumed blooming garden; listen to him: you would take a disgust for both meadow and garden. They began by forming for those graceful things called flowers three barbarous languages, which they afterwards mixed, in order to compound one still more barbarous; then every savant brought his little contributions of new barbarisms, as was done among the ancients to those heaps of stones placed by the roadsides, to which every traveller was obliged to add a pebble at least. I was about to write, at hazard, such of the words of this language made by these gentlemen as occur to me. But you would not only say, it is sad work to see flowers—that festival of the sight, as the ancient Greeks call them—thus treated; but I am sure you would not read two lines of them; therefore, I will let you off with half-a-dozen—mesocarps, quinqueloculars, infundibuliform, squammiflora, guttiferas, monocotyledons, &c. &c. &c. Have you enough? You will never make a botanist; you would have to store your memory with an endless nomenclature like the above, with the satisfaction of knowing that the learned are adding to it daily, and that when acquired you had not gained the name of a single flower. As to the names of flowers, look, at the foot of that wall, at these bunches of Mignonette or Reseda. Linnæus, who fully played his part in the barbarisms, but who considered flowers in a friendly light, and who, of all savants, has least ill-treated them—Linnæus said that the odour of the Reseda was ambrosia. Contemplate, while you can, its green and fawn-coloured spikes, inhale its sweet odour; for here comes a savant—there comes another—the Reseda is about to be transformed! In the first place, there is no such thing as odour. Botanists do not admit of odour. For them, odour signifies nothing, nothing more than colour does. Colour and odour are two luxuries; two superfluities of which the learned have deprived flowers.

Our savants are desirous that all flowers should resemble those which they dry in their herbals—horrible cemeteries, in which flowers are buried with ostentatious epitaphs. One of these savants looks at the plants, and says, "That is a Capparis, of the family of the Capparidaceæ, without stipulæ. The petals of the corolla alternate with the sepals of the calice; the filaments are hypogenous; the pistil is stipitated, and formed of the union of three carpels, the ovules attached to the three trophosperms; its seeds are often reniform, and have an endospermis—" "Gently! gently!" cries the other savant; "the Reseda is not a Capparis. The Reseda is an Euphorbia, according to Lindley, and a Cistus, in my opinion. The calyx is a common involucre; the ovary globular, seldom unilocular; the seeds are enveloped in a fleshy endospermis." "I admit the endospermis," replies the other savant, "and I allow that it is fleshy; but I maintain that the Reseda belongs to the Capparaceæ. I will further say, that it shows but little of a botanist to make an Euphorbiaceous plant of it." But let us stop! We should tear our sweet Mignonette to tatters. Listen to a savant upon another subject. He is speaking of the Marsh-mallow, a plant with round leaves and rose-coloured blossoms. Listen! "The calyx is monocephalous; the anthers are reniform and unilocular; the pistil is composed of several carpels, often verticillated; the fruits form a plurilocular capsule, which opens in as many valves as there are monosperm, or polysperm cells; the seeds are generally without endospermis, with foliaceous cotyledons." You understand nothing of this, though, perhaps, if you have an extraordinary verbal memory, you may retain some of the words. Then request the savant to tell you something about the Baobab. The Baobab, or Adansonia is the largest tree in the world; it may be taken at a distance for a forest; its trunk is often a hundred feet in circumference; it is asserted that some exist in Senegal that are over five thousand years old.

Hear the savant give a description of the Baobab:—"The calyx monocephalous; the anthers are reniform and unilocular; the pistil is composed of several carpels, often verticillated; the fruits form a plurilocular capsule, which opens in as many valves as there are monosperm and polysperm cells—" You stop the savant. "I beg your pardon, learned sir; it is of the Marsh-mallow you are speaking, or, at least, you said just the same of the Marsh-mallow but an instant ago." "Marsh-mallow or Baobab," replies the savant, "it is, for us, absolutely the same thing; we do not observe those differences which strike the vulgar, of which the dignity of science will not allow us to take notice." Savants acknowledge neither size, odour, colour, nor flavour: with them the Plum tree is a Cherry tree, the Apricot is a Plum; these very men, who, in other cases, give ten names to the same plant, call all these *Prunus*; the Almond tree and the Peach tree have but one name between them—*Amygdalus*. And then you know what charming names the pretty flowers of our field have received, no one knows whence, except from their own sweet nature; they know nothing of Paquerettes (Easter Daisy); Marguerites (the prettiest name for Daisies); Vergiss-mein-nicht (Forget

me-not). Marguerites and Paquerettes are Asters; and the pretty Forget-me-not, with all its delightful associations, is loaded with the name of *Myosotis palustris*. The rain has ceased, the sun has dispersed the clouds, and makes the drops on the leaves glitter like so many diamonds; the drooping branches recover their natural position; a linnet sings in a Hawthorn. The savants may settle their disputes by themselves.

ALPHONSE KARR.

THE LIBRARY.

INSECT DEPREDACTIONS.*

NORTH AMERICA would appear to have suffered in an unusual degree during the past year (1874) from the ravages of one or two of its insect pests. We have just received the above-mentioned "Annual Report," published by Mr. Riley, the able state entomologist of Missouri, and we learn from it that the ravages of the chinch bug and the Rocky Mountain locusts had exceeded anything that had taken place for many years. Of the devastation and ruin caused by the latter the public have already had some glimpses by the occasional notices in the newspapers and applications for assistance to support those whose crops have been ruined by them; but of the mischief done by the former little notice has yet reached this country. It appears from Mr. Riley's data, nevertheless, that although the amount of human suffering occasioned by the locusts may have been greater than that by the chinch bug, as was natural in a newly-settled country, whose population almost entirely depended for subsistence on their crops, the pecuniary loss inflicted by the latter must have been much the larger. The range of the locust is great, but it has a limit. Their natural breeding-place is the Rocky Mountains, and from them as a starting-point they have always to take their flight, and the flight does not reach much beyond the Missouri River. If, like the Colorado beetle, they could start next year from the farthest point at which they arrived, they would reach the Atlantic in a couple of years. But it appears from Mr. Riley's report that, although they lay their eggs at the farthest point they reach, and young locusts are hatched from them, yet they do not thrive—the climate or country does not suit them, and they all die out in two or three years. This is the experience of former invasions, so that Mr. Riley seems warranted in holding that the extent to which their ravages may extend will never be far beyond that of the utmost flight of fresh swarms from the Rocky Mountains. Mr. Riley has mapped out the limits to which they reach, and his assurance that they will not pass far beyond them has been of much importance to the state to which he belongs, for the scourge had almost stopped emigration to Missouri, although great districts of that state are beyond the range of the locust, and the publication of the ascertained limits of the scourge has again restored confidence, and emigration has been resumed. The fact that its range is limited, and that a large portion of the country over which it extends is either altogether unsettled or only sparsely inhabited, greatly reduces the amount of mischief done; but it has still been enormous. The money-loss caused by the locust last year is estimated at not less than ten million pounds sterling. The chinch bug, on the other hand, seems to spread without restraint wherever cereal crops are cultivated. Consequently, instead of a mere strip of territory, of say, 500 miles in breadth to the west of the Rocky Mountains, being overrun by it, it may reach from the Atlantic to the most western limits of cultivation. In point of fact, it has, of late years, been chiefly injurious in the western cultivated regions; but it has not always been so, and perhaps has originally spread from the east to the west. It does not appear at any time to have been equally destructive all over the Union. It is, therefore, very difficult to estimate the actual amount of loss occasioned by it in any year; at least, it would require a much more complete machinery for doing so than the United States as yet possesses. But we can take individual states that happen to have the necessary machinery, and from them form some faint idea of the total general loss that has been sustained. Mr. Riley gives an estimate of the

loss in Missouri on the three staple crops of Wheat, Corn, and Oats, and makes it amount to nearly five million pounds sterling. Ten years previously (1864), the estimated loss through the chinch bug in Illinois was nearly fifteen millions sterling, and, in 1871, in it and the neighbouring north-western states upwards of six millions sterling. These astounding figures will, we are sure, occasion as much surprise to American readers as to European. Many a man knows that he himself, and some of his neighbours, have had only half a crop, but it never occurs to him to think what an enormous total the loss would amount to if the individual losses sustained by every one in the like predicament throughout the length and breadth of the North American Continent were all to be brought together. It is here that we see the usefulness and advantage of the American system of appointing state entomologists for different districts. It is by some supposed that the chief duty of a state entomologist is to tell to the agriculturists and others who apply to him the names and habits of the insects they send him and the most approved means of destroying them or preventing their increase. This is, no doubt, part of his duties; and, in a new country, where competent entomologists are few and far between, no doubt an important part, but it is a very minor one where entomologists abound who know as much of the subject as the state entomologist himself, and could easily be got to supply the information were he non-existent. Any obliging entomologist would do that; but no entomologist, however willing, would—unless it were his duty, and he were paid to do it—undertake to send circulars year after year in order to obtain statistics of the extent and limits of the mischief committed by any particular insect which might show itself, and conduct an extensive correspondence regarding it; or would travel from district to district to study it on the spot, or take the labour of obtaining and sifting information from each district, showing how much money had been lost in each, or conduct troublesome and costly experiments to find the best way of dealing with the soil. If there had been no state entomologist in Missouri its inhabitants would have remained in ignorance of the extent of the dire mischief eating into the vitals of their agriculture, which has been revealed by the extensive correspondence summarised and published in the reports of Mr. Riley and his brother state entomologists. The knowledge of the existence of an evil is the first step to its cure. Do we in our own country pay sufficient attention to this? Can anyone tell us how much we lose annually from the attacks of the wire worm, Wheat fly, surface grub, Turnip fly, or any of the thousand and one insect pests that prevail amongst us? Mr. Riley, with excusable complacency, points to the pre-eminence of America in this respect. He says—"There are yet, and doubtless ever will be, those who, dwelling in cities and familiar only with such lectularious insects as cause them bodily inconvenience, have little appreciation of agriculture or of entomology in connection with it; and consider the study of 'bugs,' as they contemptuously call everything that creeps, a fit subject for ridicule. When, however, a single insect, like the chinch bug, filches four millions sterling in a single year from the pockets of the cultivators, and reduces in so much the wealth of the state, even such persons may be brought to admit that any study having for its object the reduction of this immense loss is not necessarily contemptible, small as the objects may be with which it deals. Fortunately such persons are becoming fewer and fewer, and the following pages bear witness to the fact that not only in several states in our Union, but in several countries of the Old World. In monarchies, empires, and republics alike, the authorities have manifested a remarkable appreciation of economic entomology. We have during the year witnessed Australia and New Zealand discussing and attempting the introduction from Europe of aphid parasites to check the alarming increase of those plant pests, and of bumble bees, to enable cultivators to grow their own Clover seed. We have seen France increasing her premium for a *Phylloxera* remedy to 300,000 francs, and considering plans for the destruction of the pest by constructing an irrigation canal to supply 60,000 acres. We have seen Massachusetts memorialising her legislature to pass 'an Act for the destruction of insects injurious to vegetation,' while some of our own state legis-

* "Seventh Annual Report on the Noxious and other Insects of the State of Missouri," By C. V. Riley, State Entomologist. 1875.

latures have been convened in special session to consider means of relieving the sufferers from insect ravages, and several European governments have, with forethought and wisdom, taken such measures as seemed best to prevent future injury from still other insect pests." We have occupied so much space in dealing with the generalities suggested by Mr. Riley's "Report" that we have left ourselves none for details, but we may on another occasion revert to them.

FERNS.*

THIS is undoubtedly the handiest and best book of reference of which the gardener or amateur can avail himself in the study of Ferns. It contains short technical descriptions of about 2,600 species; yet the technicalities and abbreviations, which must necessarily be employed in a work of reference, are such as anyone fond of Ferns could easily master in a few hours. The first edition was published in 1868, and there has been but little alteration since, except the addition of about 400 new or rare species, and a newly-arranged index, which may be obtained separately, and which is of itself useful as regards nomenclature, or in facilitating the exchange of specimens. Mr. Baker takes a broad and comprehensive view of the species, and has done much towards simplifying names and classification. The volume is illustrated by nine lithographic plates, beautifully drawn by Mr. Fitch, and these will be of great service to all lovers of Ferns, as they show at a glance the differences which exist between the primary divisions of the great Fern family. Altogether, the book, as we have said, is an excellent one for purposes of reference, and it is one which ought henceforth to find a place in every garden library.

THE TOMB OF THE TRADESCANTS.

THE following lines were, in 1796 (and probably still are), on the monument of the Tradescants at Lambeth:—

Know, stranger, ere thou pass, beneath this stone
Lye John Tradescant, grandsire, father, son;
They gathered what was rare in land, sea, air,
As by their choice collections may appear;
Whilst they (as Homer's Iliad in a nut)
A world of wonders in one closet shut;
These famous antiquarians, that had been
Both gardeners to the Rose and Lily Queen,
Transplanted now themselves sleep here—and when
Angels shall with their trumpets waken men,
And fire shall purge the world, these hence shall rise
And change this garden for a paradise!

Their collection of rarities was purchased by Elias Ashmole, and placed in his museum at Oxford. B. S.

Mummy Corn.—"Some twenty-three years ago Dr. Abbot, of Egyptian antiquity fame, presented my father, the late Dr. John W. Francis, with some grains of corn which he had himself taken out of a mummy. They were planted in our garden in Bond Street, and well do I remember the anxiety exhibited about the growth of this grain, which had been concealed for 3,000 years. In due course of time an ear appeared and ripened on the stalk. It resembled in many respects the Virginian corn of the present day. This proves that corn existed in Egypt before the discovery of America." The above, says the "American Agriculturist," is copied out of a very queer pamphlet, just published, entitled "Curious Facts concerning Man and Nature," by a physician. When the author has been in Egypt, and see how ingenious and active the people are in preparing "mummy grain" and other articles, for which both Maize and Doura are conveniently at hand, he may be less confident about the existence of Maize in Ancient Egypt, and the germination of any sort of grain 3,000 years old.

Art and Criticism.—It would be a great thing for English Art if in default of getting rid of Royal Academicians we could somehow abolish the preliminary banquet at the Royal Academy. Both institutions are bad, but in its effect upon public taste perhaps this is the worst. When the Prince of Wales remarks that everyone with artistic taste "must agree with him" that the present exhibition is as good as any of its predecessors, a great many ignorant persons are misled into the belief that the statement is true; and when Mr. Disraeli announces that the special triumph of English painters at the present time is in the department of imaginative painting, the public which has faith in Mr. Disraeli feels bound to discover in the exhibition those high qualities that are not by any means to be found there. A poor

* "Synopsis Filicum: a Synopsis of all Known Ferns." By the late Sir W. J. Hooker and J. G. Baker. Second edition, pp. 559. London: Hardwicke, 1874.

Academy would not in itself be such a disastrous thing for the interests of English Art if it were recognised as poor, and if there were enough critical courage and discernment to point out clearly how deplorable is the failure and how great is the necessity for increased and profounder study. But when we have on the one hand, a body of men who are certificated for life as painters of genius, and, further, when these same men invite every year Princes and Archbishops and Prime Ministers to confirm their reputation by foolish flattery and ignorant applause, there is very little chance for those who studiously watch the course of Art progress to get a hearing for a careful and real judgment.—"Examiner."

TREES AND SHRUBS.

WEIGELAS.

OF the numerous varieties of Weigelas a large number, although very beautiful, have disappeared, and scarcely half-a-dozen are to be found together, even in the very best horticultural establishments; our access to these, however, has enabled us to give a description of the following kinds:

Weigela rosea.—This variety was introduced from China by Fortune, and was described and named by Lindley. It forms a bushy plant, and has very dense foliage. The buds are of a deep rose, whilst the flowers are flesh-coloured in the interior but shading into the former colour, and here and there a flower is met with, the interior of which is pure white.

W. rosea variegata.—This shrub is somewhat more delicate than its type, with numerous branches, which are proportionately slender. The leaves also are smaller, and are edged with pale yellow. The buds are light-rose in colour, and the corolla regular; white in the inside, shading to a flesh-colour, and on the outside of a more or less deep rosy-tint. It flowers profusely.

W. Desboisii.—This is a very vigorous plant with large branches, having reddish-brown bark. The leaves are very large, as well as the flowers, which are regular and smooth, of a deep rose, or rather red colour, lightly marked in the inside; upon a portion only of the throat and upon a few flowers a long yellow stain appears, and this, most frequently, is altogether wanting. Towards the latter end of the blooming period all the flowers are of a deep blood-red colour, so that, at the time when so many varieties have lost all their beauty, *W. Desboisii* is still extremely ornamental.

W. mutabilis (var. Isoline).—This plant, which has some affinity with the variety *Stelzeneri*, is distinct even in appearance. It is very vigorous, and has long branches. The leaves in colour are a deep, dark green, and the buds are yellow and, towards the top, a light rose. The flowers are very numerous, appearing from the end of April, when they are light yellow; later on a bright rose; and finally a purple-violet in colour.

W. Isoline is easily distinguished from the other varieties by its dark appearance, and by its leaves, which are longer than those of the others. It is a vigorous plant, and the earliest of the entire group.

W. amabilis is a plant of medium vigour. The flowers are of a beautiful light rose colour, and do not change. This plant is extremely floriferous, and often assumes a climbing habit, especially when it is placed in soil that is rich and damp, and its growth is not interrupted.

W. nivea.—This is a dwarf plant, with spreading branches—some of them often lying upon the ground—and a light green bark. The leaves are a pale green colour above and silver-white beneath. The buds are flesh-coloured, and the flowers of a pure white, and never become coloured; the corolla is short and regular, and not crumpled. This variety, in all its characteristics is very distinct, and can never be confounded with any other, for it never exceeds comparatively small proportions, is somewhat late in flowering, which commences in the middle of May and lasts a considerable time.

W. amabilis (Van Houttei).—Has branches that are very robust and upright, and subsequently become curved. The flowers are large, very regular, and flesh coloured, or nearly white, inside, which changes to a spotless rose; on the outside they are yellowish-red. The plant is a vigorous and well-furnished one, having large cylindrical buds. It blooms for a considerable period.

W. amabilis alba.—The branches of this variety are wide-spreading and far apart. The buds are of a very soft rose colour, swelling towards the summit. The flowers are well separated from one another, of a milky whiteness, or flesh-coloured, on the inside, and light rose-coloured on the outside. This plant is very vigorous and very ornamental from the beauty of its flowers, which are often of different colours at the same time, some being nearly pure white, others rose, and others again nearly red. Throughout the earlier part of the blooming period the white colour predominates; later on when the hot weather has commenced, nearly all the flowers are rosy.

hued, and sometimes even red, except in the case of new blooms, upon which the flowers are white, or light flesh-coloured, which rapidly gives place to the pink tint. The blooming period is unusually long.

W. floribunda.—This variety is one of the most remarkable from the soft rose of its flowers, which are excessively numerous, and give to this plant a peculiar beauty. The leaves are thick and woolly, and the blooming period of the plant a long one.

W. arborea grandiflora.—The general appearance, the growth, and the blooming of this species, unite in making it a very distinct plant, which cannot be confounded with any other. The branches are robust, long, and wide-spreading; and the buds are long, of a greenish-yellow colour, and lightly red at the summit. The flowers are yellow, sometimes more or less rose-coloured, and regular; the corolla is very wide. *W. arborea grandiflora* is very different from all its congeners. It differs in aspect, and in the colour as well as the disposition of the flowers. The plant also flowers much later than the rest, and the blooming period is proportionately prolonged. This plant is also remarkable for the diversity of colours presented by the flowers. Thus, at the very beginning of the flowering season, they are a yellow, inclining to green. Some of them soon assume a rose tint, then others; till at last the yellow tint is the exception; and flowers of a light green, more or less rose-coloured, and sometimes of a dark purple, appear upon the same branches.

W. arborea purpurata has vigorous branches, which are erect and wide spreading. The leaves are large in dimensions, and the flowers are large, regular, and of a deep red tint over all parts, even in the interior, except in certain flowers where the divisions are a little clearer and not stained. This plant is handsome when its flowers are freshly blown, but they have the drawback of fading early.

W. Groenowegenei.—This is a very vigorous shrub, the buds of which are a deep red. It has large flowers, which are rose-coloured inside the tube, and marked on one side, as well as upon one of the divisions, with a large yellow spot. This plant, named after a Dutch horticulturist, M. Groenowegen, is remarkable for its being extremely floriferous. Of all the varieties it bears the largest, but the least decided, yellow spot on the interior of the flowers. When the hot weather comes the flowers are much more highly coloured and ordinarily more regular.

W. multiflora.—This is a bushy compact shrub, of medium growth. Its leaves are elliptical, much attenuated at the base, and hairy. The inflorescence is upright and compact. The buds are deep red, large, and sub-angulous or wrinkled. The flowers, which are very numerous, are borne upon short thick spikes, and are of a deep red colour, but not spotted.

W. graciliflora.—This is a tolerably vigorous-growing shrub, with spreading branches. Its leaves are elliptical, and the inflorescence loose and short. The buds are striped bright rose, and the flowers, which are scattered, are of a pale rose-violet colour, and last in perfection but a very short time.

W. excelsa.—This is one of the most ornamental species of the genus, and it is also one of those that grow the tallest. It is vigorous, forming an erect bush often several yards in height. The leaves, which are oval elliptic, are slightly plaited, and of a dark green colour. In colour the buds are a vinous red, lightly touched with lilac. The flowers are at first green, but subsequently become variegated with rose, and they withstand heat better than those of other *Weigelas*.

The following hybrids between *W. rosea* and *W. multiflora* were raised at Nancy by M. Lemoine:

W. Hendersoni.—This is a robust plant, with elliptic and acuminate leaves. Its buds are very pale red, almost ash-grey; flowers vinous-red, and regular in form.

W. Lowi.—The branches of this variety, which are slender, have coloured bark. Its leaves are elliptic in shape, and downy on the undersides. In colour, the flower-buds are a greyish-red; the flowers themselves small and of a deep red exteriorly, and interiorly of a lighter shade, more rarely rose; with short, regular divisions.

W. Lavalleyi.—A very vigorous shrub, the shoots of which are thick, and greenish-red in colour. The leaves are broad and regularly cordiform. The flowers, which are regular in form, are of a blood-red colour, with short, spreading divisions. The style, large and projecting.

W. Kermesina.—This is a spreading slender shrub, the flower-buds of which are highly coloured, and the flowers, when open, of a brilliant blood-red colour.

W. carminea.—This is a medium-sized shrub, the bark of which is a deep red colour, and the leaves slender and elliptic in shape. The flowers, which spread but slightly out, are of a purple-red in colour, and the style protrudes beyond the corolla.

W. Lemoinei.—This is closely allied to the preceding kind. Its flowers, which are of a very deep tawny red, are regularly tubulous, opening out but slightly at the summit. This, owing to the abundant way in which its flowers are produced, and its very deep colour, is a highly ornamental variety.

Propagation.—*Weigelas* are increased by means of layers, cuttings, and seed. Cuttings are struck under cloches, and in cold frames, any time after July, using half-ripened shoots for the purpose. The soil should be open, or rendered so by the addition of sand. The following is, however, the speediest method of increasing the stock of these plants. Get a *Weigela* in a pot, and, in January or February, place it in a forcing-house to induce it to push into growth. As soon as the young shoots reach an inch or two in length, remove them and strike them in sandy peat in very small pots beneath a cloche, where they will root in a few days. This should be continued as long as shoots can be obtained, and, when well rooted, the cuttings should be hardened off and set out of doors, re-potting them as they need more root-room. Cuttings may also be made of the ripe wood, as in the case of Gooseberries and Currants.

Seed Sowing.—The seed of *Weigelas* should be sown in spring, either in pots or pans filled with sandy peat. It may also be sown in the open-air in well-prepared ground. In all cases, the seeds should be but slightly covered, for, owing to their smallness, they will not germinate if buried too deeply. If sown in the open air, they should be shaded with branches, &c.

Pruning.—This merely consists in cutting off dead wood, and removing any too straggling branches, operations which may be effected in spring, before flowering-time; but, if it be necessary to prune more severely, it should in that case be done soon after the flowering season, as when the flowers develop upon the one-year-old wood, it is necessary to give the latter time to form if it be wished to obtain blossoms the following year, exactly as in the case of Lilac or Guelder Rose. *Weigelas*, like most other plants, vary much when raised from seed, and I should not be astonished if, in this group of plants, there was but one typical form, and, consequently, that the several varieties figured and described by Siebold and Zuccarini, are simply garden varieties. This is all the more probable, inasmuch as, at the time when the authors wrote the "*Flore du Japon*," they could only penetrate into certain localities of that country, and the majority of the plants described and figured were furnished by Japanese, probably from gardens. Frequent sowings made of *Weigelas* justify us in putting forward this hypothesis. Last year kinds differing widely from one another were obtained, far more so than most of those that are considered as varieties. Some were of extraordinary earliness, which we hope to keep; these were covered with flowers at the age of three months. Some had variegated leaves, others were of a peculiarly dwarf habit, the leaves of which were only a quarter of an inch in size. If these characteristics can be fixed, these plants should be considered as species.—"*Revue Horticole*."

THE NAIL GALL OF THE LIME TREE LEAF.

THIS must be familiar to most of our country readers, who cannot fail to have noticed the Lime tree leaves studded on their upper sides with numerous erect excrescences, at first green, afterwards yellow, then crimson, and, when withered and dried, black, looking exactly as if a quantity of small nails or tacks had been driven through from the under side of the leaf. Various explanations have been given of the origin of such galls. By some they were considered cryptogamic growths, which the older botanists (Von Fries and Kunze) placed in a genus which they called *Erineum*. Most of the growths which they included under that head, however, have since been ascertained to be due either to hypertrophy or to insect action; and, notwithstanding the remarkable fact that they are sometimes confined to one tree, which would at first sight rather seem to point to some constitutional peculiarity in the tree, there is little doubt that the majority of them are caused by some insect; and as a response to any inference that might be drawn from their attaching themselves to one tree only, we may mention that although, as we all know, Oak galls are produced by insects which are provided with large wings, some kinds of them, at least, do not seem to like to leave their tree, and are to be found upon it year after year, and on no other. Thus, we know of only one locality, and one Oak tree on which the rare Oak gall produced by the *Cynips* named *Trigonaspis megaptera*, is to be found. In the same way as the common Currant Oak gall, and the Oak root gall, stick persistently to the same tree, so the species of small midges stick to the same place. The *Cecidomyia Pyri* year after year regularly destroys the young Pears on some trees belonging to a friend of ours, while his neighbours at no great distance escape. The occasional permanent restriction of a gall to one tree is, therefore,

not necessarily a valid argument against its being produced by insects. We have made this preface because it sometimes does occur that the nail gall of the Lime tree leaf appears year after year on the same tree without wandering to any of the neighbouring Lime trees. The view now generally adopted by entomologists is that the gall in question is produced by a mite—an opinion in which we cannot concur. We believe it to be the work of a *Cecidomyia*, or midge; and we ground our opinion (1) on the observation of Reaumur, which we shall quote; (2), on the fact that in America a gall almost identical in appearance is produced on the leaf of the wild Grape by a *Cecidomyia*. The reader will naturally wonder that there should be any doubt about the matter. There can surely be no difficulty in distinguishing between a mite and the maggot of a midge, neither is there; but the curious thing is that, when the gall is opened, as it has been by thousands of competent observers, nothing is usually found within it. We have ourselves often opened them, and examined the interior and the parenchyma below the gall, and never succeeded in finding a living thing. Some few observers have been more fortunate, and all that we have to go upon is their statements; and, as these are contradictory, we have to weigh the evidence, not as to credibility, of course, for no one doubts that, but as to the true meaning and value of what each has seen. Now the first witness is Reaumur, who comes before us with the

disadvantage of being nearly 140 years old; of being, of course, ignorant of all the knowledge acquired since his time, and of having possessed very imperfect microscopic appliances compared with those which every tyro can now procure; but also with the advantage of a thorough practical personal knowledge of his subject, and much ability and acute powers of observation. That his researches are still referred to as standard authority is a sufficient warrant for listening to him with attention. Writing in 1737, he says:—"We find on the leaves of the Lime some of these galls, which are probably due to extremely small insects; the leaves of that tree are often bristled, like a kind of harrow, by long galls, the shape of which has led me to call them nail galls. They have something the appearance of nails, of which the points are above and the head below the leaf. The comparison of these excrescences to small horns slightly turned would perhaps be still more just, because, besides that they are rounded, and that they terminate in a point like

horns, their interior is hollow. It is, nevertheless, filled to a certain extent by cottony-looking hairs, which proceed from the walls of the cavity. I have opened these galls hundreds and hundreds of times without finding anything in their interior, which has often happened to me because I set about it too late. I have subsequently examined the galls at an earlier stage, while they were still green, and have found insects in almost every gall examined. I never saw more than one in each, although there is an appearance as if they might be in company." (Reaumur perhaps here alludes to some of the galls being, as it were, double, or thicker than others, or two or three proceeding from the same base.) "These grubs are long; under a strong glass they do not appear thicker than the stalk of a small pin. They are yellowish, like the interior of the gall. What makes them more difficult to find is that they do not like to walk. I often saw one, and was uncertain whether it was a grub or not until it pleased to put itself in motion. It is towards the base of the gall that we found them. When the galls get old some opening or crack takes place, by which mites, and stranger insects, introduce themselves. I have seen, for example, mites, ensconced there." All this quite agrees with what we should expect were the insect a *Cecidomyia*, and the inference that it is one is supported, as we have already said by the Trumpet Grape gall of America, which is so identical in appearance to that of the Lime,

that, if the galls could be transposed from one leaf to the other, scarcely anyone would notice the difference. It is produced by a small midge or gnat, which was described under the name of *Cecidomyia vitis viticola* by Baron Osten Sacken in his "Monograph of the Diptera of North America" as an "elongated conical red gall 0.25 to 0.3 long, on the upper side of the leaves of the Grape." Mr. Riley, the able State entomologist for Missouri, had also determined it, and in relation to it speaks thus of the present gall. He says ("American Entomologist," II., year 1870, p. 113):—"Referring to this gall in a recent letter, Francis Walker, of the British Museum, informs us that an excrescence of a very similar form, but black in colour" (he should have said crimson, it is only black when dried) "occurs on the leaves of the Lime tree in England, but that the character of the gall maker has not been determined. A French naturalist has, however, detected mites in them, and we have little doubt but the galls are caused by these mites, for mite galls of somewhat similar form are common in many parts of this country on the Plum and Cherry." We do not suppose that the French naturalist here alluded to is Reaumur, but rather M. Dujardin, who in 1850 gave a description of a mite that he had found in these nail galls, under the generic name of *Phytoptus*, a contraction for *Phytocoptes*. We think, however, that the evidence in support of its being the gall

maker is very weak. In all cases that we know of where galls of a special and distinct form are produced, they are invariably the work of some specific insect, told off, as it were, for that special purpose. In other words, the same insect does not make two different kinds of galls, and the same gall is never made by two different kinds of insects, nor on two different kinds of trees. But Dujardin found his *Phytoptus* not only in the nail gall of the Lime leaf, but also in malformed and distorted buds of the Hazel. Other authors had previously referred these galls to mites, but their conclusion is open to the same exception that we have taken to that of Dujardin. Latreille described, and Turpin figured, the producer of the gall as a species of *Sarcopites*. Duges found the same mite in a similar gall on *Salix alba*, and he regarded it as a larval form of *Tetranychus*. Von Siebold next found the same mite among the hairs of some species of *Erineum*, and named it *Eriophyes*. To our mind there is in all this a want of that restricted and definite relation between the gall produced,

the plant on which it is produced, and the insect producing it, which is essential to the relation of gall and gall maker. An insect that is found at one time in the distorted buds of the Hazel, and at another in the galls of the Willow leaf, and at a third in the galls of the Lime leaf cannot according to our view, be the maker of all three. To this matter (says the "Field") we venture to invite attention. It may be, and no doubt is, too late for this season, but perhaps some of our readers may remember it next year; and if they then find the little yellow grub seen by Reaumur, all they have to do is to envelop a few of the growing gall-bearing leaves in muslin bags to catch the larva when it comes out to undergo its metamorphosis, if it proves to be one of those that do not complete them in their original nidus (which many do), and, in that case, putting them on earth, in a flower-pot covered by a small bell-glass, breed and catch the midges when they come out.

MAZES.

MAZES or labyrinths are more common in England than elsewhere, a circumstance attributable in some measure to the excellent way in which evergreens succeed with us. They are constructed either upon level ground or upon an artificial eminence, the summit of which may be occupied by a summer-house. They usually consist of plantations



Plan of an ancient Maze.

of shrubs, in the form of hedges, enclosing tortuous paths, which constantly lead the bewildered pedestrian back to the spot whence he started, or bring him to a barrier beyond which he cannot advance, and from which, therefore, he must of necessity retrace his steps. One alone of all these paths leads to the centre, and the difficulty consists in striking upon this. In general, stiffly-growing evergreen shrubs are used; often Yews, which, from the thickness of their foliage, and the ease with which they are induced to take a variety of forms, are well adapted to this purpose. The height of the hedge varies considerably, but is usually about that of a man. The essential point is that it should be well furnished with foliage, regular in form, and pleasing to the eye. If the labyrinth be placed upon rising ground, the height of the hedge must be so regulated as not to conceal from view the highest point that has to be attained, to gain which is at once the object of the walk and the resting-place. The labyrinth that we figure to-day is one which was designed by Claude Mollet in 1653.

The Chinese Cedrela.—This is a valuable hardy tree from the north of China; it was named and described by Andrien de Jussieu ("Mém. du Mus. d'hist. nat.," XIX, 255, 294), and its introduction has long been desired. Now it appears, that this has been accomplished. In 1862, Mr. Eug. Simon sent a tree from China to the Jardin des Plantes of Paris, and Mr. Carrière took it to be a new species of *Ailantus*, and published it as *A. flavescens*. The same writer now declares it to be the *Cedrela sinensis* of Jussieu, and therefore this tree has long been in Europe, though unrecognised. There is a specimen of it in the Jardin des Plantes upwards of 25 feet high, with a girth of trunk of about 20 inches, at 3 feet from the ground. It also exists in several nurseries, and is known in commerce as the Yellow *Ailantus*, which must give way to the correct appellation of Chinese *Cedrela*.—"Illustration Horticole."

Influence of the Scion upon the Stock.—Two plants of *Abutilon Duc de Malakoff*, which were raised from seed, and which had grown some 8 or 9 feet in height, were considered to be suitable stocks, to make into standards, upon which to engraft the weak-growing, pendulous *Abutilon vexillarium* (*mesopotamicum*) *igneum*. The grafts, which were put on at about 6 feet from the ground, took readily, and some shoots were left on the stock, in order to assist in drawing up the sap until the grafts became more fully established, when it was intended to cut them away. Soon after growth commenced, however, some faint signs of variegation became apparent, and the shoots were allowed to remain. The result is, that the whole of the shoots which have broken out near the grafts have become beautifully spotted, blotched and barred with yellow, the markings being similar to those which occur in the scion. The two forms growing together, and presenting such a wide contrast in the size and outline of their leaves, are very attractive and ornamental. These plants have now been established for upwards of twelve months, and have formed good round heads. Plants treated in this manner will produce a good effect through the summer and autumn months, either placed in sub-tropical beds, or used as single plants in sheltered places on the turf.—J. WEBSTER, *Gordon Castle*, in "Florist."

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Jamesia americana.—This is now in flower in Mr. Ware's nursery at Tottenham. It is a white-flowered Rocky Mountain plant, allied to the *Hydrangeas*, and quite hardy.—Q.

Trees in Streets.—The "Birmingham Post" hears that it is proposed to plant trees in some of the open spaces in Birmingham, choosing, by preference, the districts in which the neighbourhood is most densely peopled. We have never visited a great town more wanting as regards trees, squares, or open spaces.

Barren Magnolia.—Your correspondent, "C. G." (see p. 498), is by no means the only sufferer from *Magnolias* not flowering. We have several large specimens here which, although fine healthy trees, have never been known to flower. I procured a few small plants of the Exmouth variety, and they flowered freely the first year after planting.—J. GROOM, *Henham Hall, Warrington*.

The Double Hawthorn Scentless.—The Hawthorn flowering has been exceptionally fine this year, and so continuous that even now (June 14) some of the kinds, such as double white and pink kinds, are still beautiful. The former is assuming a delicate pink hue, and becoming very pretty. It seems, however, that the double varieties have little or no smell, and, however beautiful they may be in appearance, we must confine ourselves to a limited number of them if we want sweet-scented Thorns in our hedgerows.—CHEVALIER.

An Old Sacred Tree.—The Cypress of Somma, in Lombardy, is said to be the oldest tree on record, dating from the year 42 B.C.; but at Anuradhapura, in Ceylon (noted for its ancient palaces), there is a Bo tree—a very famous object in connection with Buddhism—which, according to a writer in "Science Gossip," was planted 288 years B.C. It would have been blown down long ago but for a thick wall built round the trunk, and all its main branches are supported by pillars. The leaves that fall off are collected by the Buddhist priests every day, and are kept in a holy part of the temple. They are offered to their deity on festival occasions, also sold to the poor ignorant natives, who believe the money paid for these holy leaves will buy them the righteousness of saints. This tree is held in such reverence that it is often visited by numbers of pilgrims.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Asparagus Beds.—These, now that cutting is over, will be much benefited by a good soaking of manure-water; this, being a marine plant, enjoys salt, which, if it be added to the liquid at the rate of 2 ounces to a gallon, will materially assist *Asparagus* beds, especially such as have been long in bearing. Keep the beds quite free from weeds, which it is necessary in this case to remove by hand, as the use of the hoe would interfere with the plants. Beds that have been much cut should, at the present time, be encouraged by every means to make good growth, for on this depends their ability to keep up, in years to come, their producing powers, both as regards quantity and quality, in a satisfactory state. *Asparagus* often gets worn out much sooner than it otherwise would through suffering neglect after cutting has ceased.

Kitchen Garden.—The work here for the coming week will be of a routine character, and will consist of attention to the different advancing crops. Keep the hoe at work amongst bush fruits, so as to destroy weeds as they appear. It sometimes happens that there is negligence in this respect, under the impression that the bushes do not suffer from the presence of weeds as culinary vegetable crops do. So far as immediate effects go, this may be the case; but, wherever they are allowed to grow, they exhaust the soil much more than ordinary cultivated plants do; and to let any part of a garden become foul is simply a direct waste of the manure used, of which even bush fruit stands in need, although not to the same extent as vegetables. Amateurs will also do well to observe that if any portion of their garden, however small, be allowed to become a nursery for weeds, the seeds will be scattered by the winds in all directions, and will cause endless trouble afterwards; whilst the pleasure derived from the appearance alone of an orderly well-kept garden is worth consideration, and all the care that can be bestowed upon it. A clean garden, where every operation is carried out as soon as it requires attention, takes much less labour in the aggregate than one where things are continually behind; and in the operation of weeding this is more than usually apparent. In the southern counties, it is a difficult matter during this part of the season, unless the weather is very wet, to get a crop of Turnips up so as to escape the ravages of the fly which often cause a blank in the supply of this vegetable. Have a piece of ground in readiness, so as to sow as soon as rain falls, sowing in rows, as directed earlier in the season, and putting in a good quantity of seed to allow for those that may be destroyed by this active little beetle. When the plants are fairly above ground, if the weather becomes dry, a good practice is to water them well, and, whilst the leaves are wet, to dust over with soot—the fly does not like either the soot itself nor its smell—and a repetition of this kind of treatment will sometimes secure a crop; but, where the insect exists in great numbers, this is often impossible until the season is further advanced. It frequently happens that at the time of preparing the ground there may have been a scarcity of manure, of which some crops have not received a sufficient quantity. Where this has been the case, make up the deficiency by the timely application of liquid manure. This should take place at the middle stages of growth, after the plants have taken a fair hold of the soil and are growing away freely, and when strength will be imparted at the time it is most required. It is, however, necessary for amateur gardeners to be cautious in the use of manure-water; it must not be applied too strong, for plants, unlike animals, have not the power of rejecting the food that is given them, which, in a liquid state, goes direct to the roots, and is of necessity absorbed by them, even if their destruction is the result. If manure of a solid character, such, for instance, as fowls'-dung in a crude state, or guano that is lumpy and insufficiently broken, is dug into the soil, the case is somewhat different; the roots will not enter it, but will run in other directions to escape, as it were, the dangerous diet set before them. A little reflection upon the nature of the particular plant to which manure-water is to be applied will, in a great measure, be a safe guide as to the strength of the solution it is able to bear. As a rule, rampant-growing subjects will stand a much stronger mixture than weak growers—Rhubarb, for instance, being benefited by it at a strength that would injure Peas. Runner Beans may receive it stronger than the weaker-growing dwarf varieties; but, in all cases, it is better to be on the safe side, and rather make the solution too weak than too strong.

Flower Garden and Herbaceous Borders.—Attend to the requirements of the different plants in the flower garden by pegging them down and watering those that require it if the weather be dry, so that the whole may have a full finished appearance as soon as possible. If the soil appears to have been not rich enough for any particular plant assist it with manure-water. *Calceolarias*, above all things, must not be allowed to suffer for want of water, or the result will most likely be their dying off in quantity. Supply from the

reserve ground any blanks that may occur by odd plants going off. Spring bedding plants, recently removed to their summer quarters in the reserve ground, must not be allowed to want water, and should be still further assisted by keeping the ground clear from weeds. In herbaceous borders, when the tops of Crocuses and other spring bulbs have turned brown and are dying, they may be removed, but not before they have arrived at that state, or the roots will suffer; if these are grown in patches let a suitable stick be placed to each so as to denote where they are, without which all plants that die down are liable to be disturbed. Thin out late-sown annuals sufficiently to allow them the requisite room, and keep the ground perfectly clear from weeds, so that it may have an orderly neat appearance.

Dahlias and Hollyhocks.—As Dahlias advance in growth, see that they are kept regularly tied up. They should have three or four sticks to each plant, so as to keep them open and allow the sun and air to get to the centres. The practice of tying these plants up to a single stick is bad and unsightly; it causes them to run up tall, and affords little security against strong winds. To induce the plants to throw out strong side-shoots, pinch out the points of the leading growths. See that they are quite free from aphides, and, if any are detected, syringe with tobacco-water. Hollyhocks must be well secured to stout sticks as they increase in size, for if they get blown over it spoils them. They do not require the sticks so long as those sometimes used, unless grown in very exposed places, in which they should not be planted. If the sticks are 4 feet out of the ground after being firmly driven down, they are high enough. Do not tie them so tightly as not to allow sufficient room for the stems to thicken. On the other hand, they must not be left so loose as to chafe with the wind against the supports. Hollyhocks, as well as Dahlias, will be much benefited by a mulching of rotten dung a couple of inches thick.

Pits and Frames.—Cucumbers in frames should be gone over as often as is necessary, and the superfluous growth removed. It is a mistake to allow them to get too full of shoots as it exhausts the roots to no purpose; nor should they be allowed to carry too many fruits at one time. Cucumber plants, if kept clean, not over-borne—especially whilst young—and supplied with nutriment, will bear up to the end of the season. Continue to stop the shoots just above the joint where they show fruit, according to the advice given earlier, as this tends to prevent over-crowding, which occurs when they are allowed to run a joint or two beyond where the fruit shows. Any that have been bearing some time, and have filled the soil with their roots, should now receive manure-water twice a week, always giving this, as well as water used in a clear state, tepid. Melons that have set a crop of fruit should be well watered, and all useless shoots removed, and the whole energies of the plants will thus be directed into swelling off the fruit.

Houses—Stoves.—Gloxinias will now be full of flower, and will be assisted by an occasional application of manure-water. Keep them near the glass, so as to induce a stout, robust habit, without which the blooms are soft and useless. A shelf over the paths is a good situation for these plants. Achimenes in pots and baskets should have their stems supported with small sticks neatly tied thereto. It is not good practice to give all the plants an equal amount of shade. Allamandas, Bougainvilleas, Ixoras, and Dipladenias will succeed better with much more sun than many plants will bear, consequently they should be placed at the warmest end of the house, and only receive a slight protection from the sun in the middle of the day. Climbing plants that are grown in pots and upon trellises should, when they have set a good crop of flowers, be trained over the trellises, but not too closely. Subjects of the above character that are grown permanently as roof-climbers should not be allowed to go too long without training, or they become an impenetrable thicket of shoots, and necessitate much cutting away. Do not allow plants grown for this purpose to become too much crowded, or they suffer themselves, and injure everything grown under them.

Flower Garden and Pleasure Grounds.

All that is now required in this department will be unrelaxed attention to ordinary routine operations, and these, during very dry or unfavourable weather, will be sufficiently onerous, and must include careful treatment of the newly-planted flower beds, supplying them with abundance of water when the weather is dry; pegging-down, staking, and regulating the growth of the various plants; and making good any deficiency which may from time to time occur from the store of each kind of plant which has been used, and which should always be kept in hand for some time at least after the beds have been planted. Give plenty of water to fine-foliaged or sub-tropical plants in order to induce a free and vigorous growth, as only when in this condition can their great beauty be fully developed. Mulching the surface of the soil with partially rotted

manure, or some other porous enriching material is of the greatest importance, and tends to promote that equable state of moderate moisture which is of such consequence to all kinds of plants. In the absence, however, of any mulching material, keep the soil frequently stirred, so as to render the surface loose and friable, and thus prevent, to some extent, undue evaporation. Attend also to staking and tying-up Dahlias, Hollyhocks, and other tall-growing herbaceous plants, before they become bent or broken down; and, before doing this, the shoots may with advantage be carefully thinned out. Keep lawns, Grass walks, and belts, free from broad-leaved weeds of every kind, as their presence tends in all cases to mar the beauty of the turf. Now that the planting of the flower-beds and borders has been completed, it will be unlikely that heavy traffic will for some time take place upon the various gravel paths in and about the parterre; advantage, therefore, should be taken soon after the first considerable fall of rain, to loosen up the surfaces of all such walks, and apply a slight dressing of new and clean gravel. Rake the same level, and at once roll it well down with a heavy roller, and the walks will, in most cases, after this remain in good condition throughout the remainder of the season. Whenever the weather is dry, the barking of Oak should be pushed forward. By the end of the month, Coniferous seeds should be well above ground. Experience has proved that red lead applied to the seeds of Scotch Fir, Spruce, Larch, and similar seeds, just before sowing, is a sure preventive of ravages from birds. The young plants do not appear to suffer from the "coating," but whether or not the ground, if sown with red-leaded seeds for years successively, would be "sickened," is a question worth studying. Gather Elm seeds, and sow at once, before the coating of the seed hardens. Evergreen shrubs and trees, such as Portugal Laurels, Hollies, Cupressus Lawsoniana, &c., may still be planted, watering plentifully during dry weather.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Roses.

The climbing varieties of Teas and Noisettes need but little pruning if they are required to cover a house, or to furnish large quantities of cut flowers, as strong growth, and the laterals from this growth, are most productive of blooms. The lateral growths should, in my opinion, be pruned back to the stem as soon as the flowers are cut; fresh buds will then be sent out from the same stems, and Standen's, or any liquid manure, should then be applied to assist the plants in providing nourishment to the buds, which thus produce finer flowers. It is not to be supposed that these Noisettes or strong-growing varieties will remain well furnished if they are not thinned out at the proper time. If a plant is required to furnish a greenhouse or wall, the young shoots must be encouraged, and a few of the weaker shoots thinned out, and then by training the growth horizontally instead of perpendicularly, as in most cases is the practice, it will be found that the laterals will break more evenly, and the plants will not be so bare at the base. I have found that, by reversing the direction in which the strongshoots are growing before they break into flower, buds that have been quite dormant will be formed. If a plant of Maréchal Niel is required to cover a conservatory, it is advisable to carry one or two strong growths as high as the spring of the roof, and then direct the points horizontally, right and left. The shoots that spring from these may be carried, at equal distances apart, to the apex of the roof. If the shoots are carried at once perpendicularly, and without check, to the ridge of the house, they are sure to be very bare at the bottom, as the strong varieties of Teas and Noisettes do not break so freely as the Grape Vine does when treated on the same principle. If the above advice be carefully attended to, the plants thinned out, and the flower-shoots pruned back, it will be found, with watering and keeping the plants free from blight, that the Maréchal Niel, Devonensis, and Lamarque Roses will flower twice in the season.—H. G.

Indoor Fruit Department.

Vines.—Fruit on late kinds should now be set and ready for thinning. As late Grapes are ripe at a date when they are subjected to damp, the berries should be thinned out more than is necessary in the case of Grapes that are to be eaten as soon as ripe. No rule as regards distance between each berry can be laid down, as the same variety does not swell equally everywhere, but most people are more apt to err in thinning too little than too much. Black Alicantes must be thinned as soon as the berries can be seen, for, when left for a few days after this, the bunches generally become a solid mass, which cannot be conveniently operated upon. Lady Downes should not be thinned so early, as many of the berries are imperfectly set, which, if left to form a bunch, come to nothing. The berries of the black Lady Downes are also liable to become more deformed than any other kind; and, to obtain them of a perfect and uniform shape when matured, the worst-looking must be removed. Scalding of the berries during the stoning period is an evil which this variety is very

subject to, and, in those places where every means have failed to check it, the bunches should not be thinned so much at the present time as they will ultimately require, in order that there may be a reserve to take the place of those which may decay. Vines setting and swelling their fruit at an early stage should not be kept closer during the heat of the day than those colouring. They should, however, be shut up early in the afternoon, and a little air should be given in the evening and throughout the night. The atmosphere in houses where the fruit is ripe, or ripening, must not be kept too dry upon hot days, or the foliage, which is always of much service, even after the fruit is cut, will be injured. To prevent this, damp the pathways and surface of the border at mid-day, and in the afternoon when it seems necessary.

Pines.—When the successional plants in fruit are in a house or division by themselves, they are much benefited by being shut up as early in the afternoon as circumstances will permit until the fruit is out-of-bloom. The atmosphere should be made very moist by damping all bare surfaces; but avoid syringing the plants overhead while the fruit is in bloom, as this is a sure way of producing deformed fruit.—J. MUIR.

Hardy Fruit.

The sudden fluctuations in temperature of the last two or three weeks, accompanied with east and north-east winds, have caused blight to appear on all kinds of hardy fruits; Apples especially are attacked by it in a most virulent manner, and, if they are as bad in other districts as they are in this, I fear the crop will be light. The heavy rains of the last few days have been of great benefit to the trees, and let us hope that much of the fruit will thereby be saved. Thoroughly wash with the garden engine all infected wall trees; clear water, if used with force, is better than all the insecticides that have as yet been invented. Cut off the useless spray from Apples, Pears, and Plums, and any still requiring it should have the superabundant fruit removed forthwith. Morello Cherries should be treated in much the same way as Peaches, only, instead of disbudding, pinch all the shoots back to the first or second joints, with the exception of one at the base and top, and these should be laid in for fruit-bearing next season. Strawberries now ripe and ripening must be protected from birds by means of netting, from slugs by searching for them early in the morning and at night, and from rats and mice by trapping them. Layer runners both for planting out and forcing at the earliest opportunity in 60-sized pots, which are most convenient for the purpose; a piece of turf in lieu of crock will prevent the necessity for disturbing the roots when planting or potting. Our earliest kind this season was La Grosse Sucrée, which we gathered in quantity (from plants on a south border) on the 9th inst. The suckers on Raspberry "stools" should be well thinned out, leaving only four or five, and these the strongest on each stool; mulch with long litter, and water freely should dry weather again set in. Any kind of tree carrying a heavy crop of fruit may be effectually assisted by a mulching of manure, a watering with diluted sewage or liquid manure, or by an occasional sprinkling of guano or soot during showery weather; the manurial properties of the soot are much greater than many imagine. Like water, it is too cheap to be sufficiently valued.—W. WILDSMITH, *Heckfield*.

Winter Forcing Violets in America.—Cuttings are taken off during the winter and, when rooted, are potted-off into 2-inch pots and kept in a cool house until the spring. At the end of April a piece of new ground is secured, into which plenty of old manure is ploughed deep, and the soil thoroughly pulverised; in this the plants are placed 1 foot apart in the row, by 18 inches the other way. All runners must be taken off during the summer, and at the end of September the plants are lifted, potted into 7 or 8-inch pots, according to the size of the plants. They should be potted as firmly as possible, well watered, and the pots placed in an upright position out of doors. They should be removed to the greenhouse the first week in November, when fire heat should be sparingly used for some time, and the plants kept on the side benches, so as to be near the glass. The syringe must be used freely to keep off red spider, and the plants fumigated twice a week to save them from greenfly. If properly attended to, these Violets pay well, for they sell at 3s. per hundred during the holidays, and realise 2s. during the winter. The best crop I witnessed at any place was at Mr. John Henderson's, of Flushing, New York, last winter. They were a complete mass of buds, and I was assured they were the best plants they had for cut flowers. Most growers plant them out on the benches, but I do not think that this plan is as good as potting. Planting-out induces the plant to make more growth, though not a corresponding number of buds, while under the potting system the roots have not so much action, an unnecessary growth of wood is prevented, and the whole crown of the plant formed during the summer is forced into flower.

Marie Louise is the only kind now grown on a large scale for commercial purposes, as it produces a far larger number of buds than any other.—J. H.

Plants as a Test of Water.—The quality of water in relation to its fauna and flora has been the subject of investigation by some of the French Academicians. In substance the results seem to prove that water in which animals and plants of higher organisation will thrive is fit to drink; and, on the other hand, water in which only the infusoria and lower cryptogams will grow is unhealthy. If the water become stagnant and impure, aquatic plants of the higher order will languish and disappear, and the half-suffocated fish will rise near the surface and crowd together in parts where there may still be a little of the purer element trickling in, and if driven from these places they soon die. No mollusc will live in corrupt water. Plants also exercise a reactive influence on the quality of water. The most delicate appears to be the common Water-cress, the presence of which indicates excellent quality. Veronicas and the floating water-weeds flourish only in water of good quality. The Water-plantain, Mints, Loosestrife, Sedges, Rushes, Water-lilies, and many others, grow perfectly well in water of moderately good quality. Some of the Sedges and the Arrow-heads will thrive in water of very poor quality. The most hardy or least exacting in this respect is the common Reed, or *Phragmites communis*.—"Nature."

OUR WATER SUPPLIES.

WHILE our large towns are yearly becoming more and more alive to the necessity of improving their water supply, and rendering themselves independent of local sources that may suddenly fail when the demand upon them is most urgent, country districts have, in this respect, fallen very much behindhand. We hear of many villages, from which the supply of some neighbouring towns is mainly derived, left almost entirely without water themselves, or, at any rate, without facilities for obtaining in a regular manner their due share of it. The necessity in large towns, where local sources may be unequal to the demand upon them, or are liable to be contaminated by the noxious matter that may find their way into them, of devising an efficient artificial system of supplying the inhabitants with water, is so obvious and so pressing, that public attention would naturally be drawn to it first. But in rural districts, it is only occasionally, and not all the year round, that want of water makes itself urgently felt, and then the sufferers are for the most part poor people, who put up with the discomfort as one among the many inconveniences attaching to their position in life. Moreover, the deprivation being usually only of a temporary character, the hope that it may not last long, but that some seasonable changes of weather may bring relief, disposes them to endure it with little complaint, and, when the grateful change comes, to believe that perchance it may not occur again. Within the last year or two, the requirements of rural districts have, however, been brought into public notice, and facts have been elicited with reference to the distress which in periods of drought prevails in some of them, which are of a somewhat startling kind. We are accustomed to think that, in the country, at any rate, water is a commodity which, like the air we breathe, can be bought without money and without price. It is, therefore, a little astonishing to hear of some villages where, in dry seasons, the poor people have had to pay for it at the rate of a penny a gallon, and others where they bought it at twopence the bucketful, and were obliged to be so chary with it as to use the same water twice for washing, and to make one pailful serve the purpose of a household of six or seven persons. Yet the investigations instituted by certain members of the Social Science Association showed that these and similar results of deficient water supply have long existed in many parts of England. In several instances the discomfort occasioned to the poor from this cause has been due to the apathy or positive neglect of local landowners. It was only a few weeks ago that, on the estate of a wealthy but non-resident proprietor in one of the eastern counties, we ourselves came across a case of the kind, where the occupiers of a cottage of a somewhat superior class as a residence were driven to great straits for want of water. They had, said the wife—a remarkably decent woman, and the mother of half-a-dozen young children—nearly two buckets of rain water left; but they were almost afraid to make use of it, as they knew not where to get more when that was gone, while all the spring water they consumed was brought in bottles from a well, distant rather more than a mile from their cottage. This poor woman gave a practical illustration of the equanimity with which people in her station in life put up with discomforts that would be intolerable to those in a higher social position; for when we enquired how she could endure such a state of things, she answered cheerfully that they "lived in hopes of rain." Now this was a case in which, if the landlord had been resident, and

had managed his own property instead of leaving it to the care of an agent, the evil would probably have been soon remedied, as a proper tank for the storage of rain water might be constructed, if Sir Philip Rose's estimate of the cost of such receptacles be correct, for about five pounds. That a tank to hold the rainfall on the roof of an ordinary-sized cottage would generally suffice to supply the wants of the household for all purposes except for drink throughout the entire year, the enquiries of Mr. Bailey Denton and others who have paid attention to the subject have fully proved. That gentleman stated that a tank capable of holding 2,500 gallons, a quantity which may be collected from the roof of a cottage by conserving the rainfall to a depth of 6 inches—a depth less than half that which must be reckoned for under any circumstance—may be made for from six to seven pounds, and that this would afford a supply to a household of five persons, using four gallons each per diem, for more than a third of the year; and, of course, during many months it would be unnecessary to trench upon this store at all. Moreover, besides the consumption for various purposes by the population, the demands of live stock during a time of drought occasion, when the surface water is not caught and saved, great labour and expense in cartage, and often serious loss in the deterioration of the animals themselves, where the supply, however obtained, is deficient in quantity or bad in quality. At the discussion which followed the reading of Mr. Bailey Denton's paper, Mr. Baldwin Latham stated that the residents on the Surrey Hills were often dependent upon water ladled out of ponds, which was so thick that it had to stand for hours in buckets before it could be used; and the sight of cattle wandering over the meadows in search of the last drop of muddy water that may be left in the dried up ditches and pools is a pitiable one, which most of us have witnessed in a dry summer.—“Field.”

SOCIETIES AND EXHIBITIONS.

ROYAL BOTANIC SOCIETY.

JUNE 16TH.

THIS was in all respects an attractive exhibition, the new plants staged by Messrs. Veitch, Bull, Williams, Rollisson, and Henderson occupying a prominent position in the centre of the tent. Stove and greenhouse plants, and Orchids, were well represented by Messrs. Williams and Jackson among nurserymen, and by Mr. J. Ward, and other amateur growers. Pelargoniums and Roses were also strikingly effective.

New Plants.—In Messrs. Veitch's collection of these, we remarked the following:—*Crinum americanum*, a fine kind, having bright green undulated foliage, and bearing a stout umbel of white-petaled pink-anthered flowers; *Zamia Wallisii*, a species with large oblong bright green leaflets or pinnæ, borne on the extremity of a long, slender, and gracefully arched petiole; *Dracæna Levangerii*, a native of the South Sea Islands, having deep green crimson-edged lower leaves, the young foliage being of a creamy-yellow colour, suffused with red; *Dracæna Tylori*, a robust and distinct garden hybrid, raised between *D. magnifica* and the well-known *D. Mooreana*, dense in habit and bronze-green in colour, the petioles being dark red as in *D. Mooreana*. *Sarracenia Stevensii*, a beautiful hybrid of free growth, having erect bright green pitchers veined distinctly with bright red; *Anthurium Scherzerianum longiflorum*, a distinct variety of the Flamingo plant, having very long and proportionately narrow spathes of a brilliant colour. The same group also contained a new species of *Verschaffeltia*, with vivid deep green leaves; the orange-yellow-flowered *Blandfordia nobilis*, *Cattleya Mendelii*, *C. gigas*, *Trichopilia lepida*, *Clematis excelsior*, a semi-double purple-flowered variety; *Croton Veitchii*; half-a-dozen well-grown Pitcher plants, in baskets, a fine specimen of the new epiphytal *Platynerium Willinkii*, and some pretty little plant curiosities in the form of *Darlingtonia*, *Cephalotus*, and *Droseras*. Not the least attractive plants in this group were some distinct and vigorous new seedling *Gloxinias*, among which were the following:—*G. Lisère d'Argent*, an erect-flowered variety, having scarlet-white-margined flowers flushed with pale rose at the back; *Boule de Neige*, an erect-flowered pure white variety; *Marquis of Lorne*, a large-leaved drooping-flowered variety of delicate lavender-purple with a pure white throat; and *Mrs. Haines*, a robust large-flowered sub-erect kind, of a deep rosy colour, with a crimson throat. Mr. Bull's collection was rendered conspicuous by a splendid specimen of *Godwinia gigas*, the mottled stem of which was as thick as one's wrist, and bore at its apex a great umbrella-like head of bright green leaflets. In the same group were also *Geonoma Seemannii*, a deep green-foliaged Palm, the ribbed leaves of which are bifid; *Pritchardia grandis*, a dense-habited Palm, having rounded fan-shaped foliage, of the brightest and deepest green imaginable; *Dipladenia Brearleyana*, with flowers of a bright crimson colour, the buds and partially-opened blossoms being delicately tinted with bright rose; *Bertolonia Van Houttei*, a kind having oblong leaves of a deep velvety green, netted and dotted with rosy-carmine; *Dracæna Goldiana*, a species with ovate acuminate deep green foliage, conspicuously barred with silvery-grey. Associated with these were also potfuls of the bright orange-yellow *Lilium Thunbergianum splendens*, the silvery-edged *Sibthorpea europæa variegata*, *Anthurium Scherzerianum album*, and

Hydrocotyle nitidula, a fresh green-leaved plant, closely resembling the Cornish Moneywort, and useful for the decoration of baskets; a potful of *Lilium canadense rubrum*, the flowers of which are more deeply coloured than those of the usual form; two plants of the singular looking epiphytal *Marcgravia paradoxa*, established on pieces of deal board, and afterwards severed from the parent stem. The same exhibitor had likewise effective groups of new *Dracænas*, among which were *D. Goldiana*, *amabilis*, *Guilfoylei*, *Hendersoni*, *metallica*, *Mooreana*, and others; also *Crotons volubile*, *spirale*, *undulatum*, *Youngii*, *Veitchii*, and *majesticum*. Mr. B. S. Williams had an effective group of new Palms, Ferns, *Dracænas*, *Crotons*, and *Orchids*; also well-flowered plants of the snowy-white *Lady's-slipper*, *Brearley's Dipladenia*, *Veitchia Canterburyana*, one of the most elegant of pinnate-leaved Palms of small growth; *Dracæna Fraseri*, and the singular-looking *Huntsman's Cup* (*Sarracenia purpurea*). Among new Ferns staged in this group, we noticed *Adiantum gracillimum*, the most delicate of all known Maiden-hair kinds; *Dictyogramma japonica variegata*, figured and described in our last issue; and *Pellaea ornithopus*, a delicately-cut tripinnate Fern, with glaucous-oblong pinnæ set on a slender black rachis. Messrs. E. G. Henderson & Sons contributed an effective group of new florists' flowers, succulent plants, Ferns, and stove and greenhouse plants, among which were *Pilocereus senilis*, commonly called the “Old Man Cactus,” owing to its apex being covered with long white hairs; *Eryngium eburneum*, with Aloe-like bright green spinose leaves, and a variety of *Sedum californicum*, glaucous and rosette-like in habit, and bearing clusters of bright yellow flowers. In the same collection were several new variegated *Dioscoreas*; a plant of the curious deciduous terrestrial Orchid, *Pogonia discolor*, *Kämpferia Roscoeana*; *Eranthemum reticulatum aureum*; *Lomatia elegantissima*, a distinct greenhouse shrub, having finely-divided bright green leaves, useful for button-hole bouquets; *Podocarpus macrophylla variegata*, a distinct Japanese shrub, having bright green leaves, margined with white; *Sonchus elegantissimus*, one of the most elegant of all dinner-table plants; some new hybrid succulents, including *Echeveria spathulata*, *grandisepala*, *imbricata*, and others; also the new *Echeveria Peacocki* (*E. Desmetiana*), *farinosa*, a beautiful silvery form, and the deep bluish-green *E. eximia*. This collection was set off to advantage in front by means of small specimens of *Adiantum Farleyense*, the young fronds of which had acquired a deep rosy tint, owing to their having been grown in an airy house without shading. Some neat little specimens of *Thalictrum minus adiantifolium* were also much admired; for Fern in bouquets and other floral decorations this forms one of the best of all substitutes.

Stove and Greenhouse Plants.—These were well represented by Mr. Ward, Mr. Wheeler, Mr. Donald, Mr. Ritchie, Mr. Mearns, and others among amateur growers; and by Mr. B. S. Williams, Messrs. Jackson, and Mr. Morse among nurserymen. Mr. Mearns had an effective and well-grown group in which were *Stephanotis floribunda*, 4 feet in height, a perfect mass of snowy blossoms; well-grown *Bougainvillea glabra*, profusely covered with mauve-coloured bracts; the scarlet-spathed *Anthurium*; *Dracophyllum gracile*; *Erica Cavendishi*; and others. Mr. Ward furnished well-staged plants of the purplish-blue *Statice profusa*; *Erica tricolor impressa*, 4 feet in diameter; a well-bloomed specimen of *Kalosanthes coccinea* var. *Phoenix*, one of the most showy of its class; *Bougainvillea glabra*; *Clerodendron Balfourii*; *Aphelexis macrantha*; and others equally well grown. In the class of six plants, Mr. Ward was also first with the vivid orange-flowered *Ixora Williamsii*, *Aphelexis macrantha purpurea*, the delicate rosy-tinted *Erica Candolleana*, *E. Cavendishi*, and good specimens of *Stephanotis floribunda* and *Statice profusa*. Messrs. Jackson staged twelve small but well-grown specimens, consisting of the white *Ixora Colei*, *Allamanda cathartica*, *Statice profusa*, two or three *Azaleas*, and a vigorous specimen of *Phænocoma prolifera*. Mr. Williams furnished an effective group of six well-bloomed plants, including the scarlet-spathed *Anthurium*, bearing from twenty to thirty brilliant bracts; the pale yellow *Allamanda grandiflora*, *Dracophyllum gracile*, *Aphelexis macrantha purpurea*, and *Hederoma tulipiferum*, in beautiful condition. Heaths, both well grown and flowered, were staged by Mr. Ward and Messrs. Jackson, and a splendid bank of fancy and show Pelargoniums came from Mr. Ward, Mr. James, Mr. Turner, Mr. King, Mr. Catlin, Messrs. Dobson, and others. Mr. Burley contributed several baskets of new silvery-variegated and scarlet-flowered zonal Pelargonium, and a *Coleus* similar in colour and habit to *Duchess of Edinburgh*. Mr. Bull exhibited his new Pelargonium *Queen Victoria*, and a new semi-double-flowered Ivy-leaved variety named *P. longipes König Albert*, a free-growing plant with rosy-lilac flowers.

Orchids.—Of these a fine group came from Mr. Denning, gardener to Lord Londesborough, who had splendid plants of *Lælia purpurata*, with three spikes, embracing in all seventeen flowers; *Dendrobium formosum*, with fourteen fully opened flowers of pearly whiteness, each having a great orange-yellow blotch on its widely expanded lips; *Dendrobium Bensoniæ*, with nine flowering bulbs; *Anguloa Clowesi*, with fourteen or more great yellow Tulip-like blossoms; a vigorous plant of the well-known *Oncidium Lanceanum*, bearing a great branched spike, on which there were twenty-five flowers; and the robust-growing *Aërides Lindleyanum*, 5 feet high, with two branched spikes of white rosy-lipped flowers. Mr. J. Ward contributed a well-grown collection, in which were *Masdevallia Harryana*, with fifteen blood-coloured flowers; a superb example of the Shaggy *Lady's-slipper* (*Cypripedium villosum*); a strong specimen of *Odontoglossum crispum*, bearing seven or eight fine spikes; and a beautiful example of *Phalænopsis grandiflora*, bearing seven well-bloomed spikes of snowy blossoms. Mr. Ward, Mr. G. Wheeler, and Mr. Heims also all showed groups of twelve plants; in Mr. Ward's collection was a well-flowered plant of the Ceylon Mayflower

(*Dendrobium M'Carthyi*), bearing about thirty fully expanded blossoms; also a vigorous plant of *Epidendrum vitellinum majus*, bearing two stout spikes of large scarlet yellow-lipped flowers. Mr. Heims furnished a plant of the Mexican Mayflower (*Lælia majalis*), the variety of *Phalænopsis grandiflora* called *aurea* or *Ruckerii*, and a well-bloomed specimen of *Aërides odoratum majus*, bearing at least twenty spikes of fragrant wax-like blossoms. In the nurserymen's classes, Mr. B. S. Williams, Messrs. Jackson, and Mr. Morse, were the principal exhibitors. In the class of six Orchids, Mr. Williams had well-furnished plants of *Cattleya Mossiæ*, *Odontoglossum Pescatorei*, the Bearded Lady's-slipper—with about fifty well-developed flowers, *Anguloa Clowesi*, a good *Sobralia macrantha splendens*, and a noble plant of *Aërides odoratum majus*, 5 feet high, and well bloomed. In the class of twelve plants, the same exhibitor staged *Masdevallia Harryana*, bearing twelve flowers; *Cypripedium spectabile*, bearing ten fully-open flowers; the *Madeira Orchis foliosa*, with eighteen densely-packed spikes of purplish-lilac flowers; *Anguloa Clowesi*, well-bloomed and excellent examples of *Cattleya Mossiæ*, *Vanda tricolor*, and *Cypripedium superbum*. Messrs. Jackson staged smaller but equally well grown specimens, the more remarkable among which were *Cattleya Mossiæ superba*, with large and beautiful blossoms; and fresh specimens of *Aërides crispum*, *Cattleya Mendeli*, *Epidendrum crassifolium*, and *Dendrobium Parishii*.

Roses and Ferns.—Messrs. Paul & Sons, Cheshunt, staged collections of Roses, among which were fine examples of *Celine Forestier*, *Camille Bernardin*, *Jules Chrétien* (a delicate rosy-lilac variety of good form), *Madame Victor Verdier*, and the soft rosy *Madame Laurent*. Messrs. Paul also furnished a splendid miscellaneous collection of small, but remarkably well-bloomed, pot Roses, among which we noted *La France*, one of the best of light show varieties; *Madame Rivers*, an old-favourite, having delicate pink globular flowers; *H. P. Duke of Edinburgh*, a glowing crimson-scarlet; *Princess Beatrice*, a soft blush; and many others. Messrs. Veitch & Sons contributed a well-arranged group of pot Roses, backed up by elegant cut-leaved Japanese *Acers*, and set off in front by boxes of cut Roses and shrubby *Peonies*. A new hybrid *Perpetual Rose*, named *Sultan of Zanzibar*, was exhibited by Messrs. Paul & Sons. It is glowing crimson-scarlet in colour, and a seedling from *Duke of Edinburgh*, bright and distinct, and is sure to become a favourite. Mr. Chas. Turner, of Slough, sent ten stands of cut Roses in admirable condition, some of the flowers being very fine and beautifully-coloured. As regards Ferns, six good specimens were staged by Mr. Donald, gardener to J. Barclay, Esq., Leyton. Among these were well-grown examples of *Gleichenia dichotoma*, *Adiantum Cardiochloa*, *Dicksonia antarctica*, *Cyathea dealbata*, and others. Mr. Shear, gardener to E. Brooks, Esq., Highgate, had a splendidly-grown *Adiantum Farleyense*, a good *A. cuneatum*, and a fine mass of the pale green *Leucostegia immersa*. Mr. Child, gardener to Mrs. Torr Ewell, staged a fine mass of *Davallia bullata*, fresh and effective; *Adiantum Farleyense*, in fine trim; and a noble *Gleichenia Speluncæ*. Mr. B. S. Williams had splendidly-grown examples of *Gleichenia Mendeli*, and *G. Speluncæ*; also a noble specimen of *G. semivestita*. Mr. Ritchie furnished an excellent group, including one of the finest specimens of *Davallia Mooreana* we have yet seen; and the same may be said of a specimen of *Gleichenia dicarpa*, staged in a group of fine-foliage plants by Mr. Child.

Miscellaneous Subjects.—A group of cut specimens of hardy flowering shrubs came from Messrs. Veitch, including the yellow-flowered *Fremontia californica*, *Escallonia macrantha*, *E. sanguinea*, several kinds of *Andromeda* and *Spiræa sorbifolia*. The same exhibitors also had a new weeping purple-leaved *Beech*, and a basket of *Cissus orientalis*, an extremely elegant cut-leaved climber. Mr. R. Parker, of Tooting, staged an effective group of hardy herbaceous plants, among which we noticed good specimens of *Orchis foliosa*, a purple-flowered species from *Madeira*; *Spiræa palmata*, with bright rosy flowers; two good potfuls of the orange-flowered *Lilium Thunbergianum*; rose and cream-coloured *Peonies*; and some effective varieties of *Pyrethrum roseum*, together with *Spiræa Aruncus*, *Erigeron purpureum*, and others. The same exhibitor also staged some effective stands of cut flowers of *Peonies* and rosy *Pyrethrums*. A group of herbaceous plants came also from Mr. G. Wheeler. Mr. Ley, of Croydon, contributed an effective collection of *Palms*, *Cycads*, and other decorative plants, among which were new *Marantas*, *Abutilons*, and other plants. Some dwarf free-flowering blue and purple bedding *Violas* came from Mr. Gray, Eglinton Castle, Irvine, N.B. Mr. Laing, Stanstead Park, sent an effective group of bronze zonal *Pelargoniums*, *Ferns*, *Palms*, *Pandanus*, and other decorative plants. Messrs. Rolisson & Sons showed a fine panful of *Dionæa muscipula* or *Venus's Fly-trap*, and some well-grown plants of the beautiful new *Bertolonia Van Houttei*. The exhibition was visited in the morning by the Seyyid of Zanzibar, who seemed to take much interest in it. He has himself been the means of introducing many new plants into Zanzibar, upon the improvement of the gardens of which he is said to bestow much attention.

Plants to which Certificates were Awarded.—*Asplenium ferulaceum*, *Alsophila hirta*, *Anthurium cordifolium*, *Davallia Youngii*, *Dracæna Taylori*, *Nepenthes rubra*, *Platynerium Willinkii*, *Zamia Wallisii*, *Begonia Emperor*, *Betula purpurea*, *Purple-leaved Peach*, and *Gloxinias Madame Patti*, *Marquis of Lorne*, and *Lisère d'Argent*, from Messrs. Veitch; *Kentia Moorei* (true), *Sibthorpia europæa variegata*, *Croton picturatum*, *Dracænas Rex*, *triumphans*, and *rubella*, *Lomaria Dobroydensis* and *capensis*, and *Cybotium Menziesii*, from Mr. Bull; *Sedum californicum*, *Saxifraga notata*, *Zamia colocoma*, and *Dracæna Princess of Wales*, from Messrs. E. G. Henderson; *Pellæa ornithopus* and *Zamia Lindenii* from Mr. B. S. Williams.

ROYAL HORTICULTURAL SOCIETY.

JUNE 16TH.

MESSRS. Veitch furnished on this occasion half-a-dozen new plants; and a collection of new double white and scarlet-flowered Zonal *Pelargoniums* came from Mr. Laxton, of Stamford. The Rev. M. J. Berkeley made some remarks on a supposed new form of Potato disease alluded to elsewhere (see p. 500).

[Floral Committee.]—Messrs. Veitch & Sons staged the following new and rare plants:—viz., *Dracæna Taylori*, a robust growing kind, with broad oblong, wax-like foliage, of a dull bronze-green tint, the petioles being of a deep red tint; *D. elegantissima*, one of the small-growing section, having slender lance-shaped bronze-tinted leaves, margined with bright crimson; and *Asplenium ferulaceum*, an elegant Fern from Colombia, having finely divided bright green fronds, which arch gracefully over the sides of the pot. Mr. Laxton, of Stamford, sent some seedling white and scarlet double-flowered zonal *Pelargoniums*, among which *Pearl*, the *Ghost*, and *Boweanum*, were conspicuous. The best, however, was *Wilfred*, alluded to below. *Fair Maid of Kent* is a strong-growing, free-blooming double blush kind. *Tom Tit*, scarlet, and *Guiding Star*, are also both effective rose or magenta-coloured sorts. The same exhibitor likewise sent two new seedling *Roses*, viz., *Vivid* (H. P., a bright crimson-scarlet), and *Lady Isabel Cecil* (a creamy-yellow tea-scented variety, likely to be a valuable addition to its class). Mr. F. Perkins, of Leamington, furnished a semi-double flowered form of *Lilium Thunbergianum*, a golden-leaved form of the common *Hart's-tongue Fern*, and a strong plant of *Pteris serrulata major cristata*. Messrs. J. Carter & Co. staged strong plants of a new *Coleus*, having large maroon foliage, edged with yellow, but no great advance on *C. Bausei*. Cut blooms of Bedding *Pansies* came from Dr. Stuart, Hillside, Chirnside, N.B. Messrs. Cripps & Sons, Tonbridge Wells, contributed plants of their new *Clematis leviathan*, a large double form, not equal, however, to *C. Fortunei*; *C. Grande Duchesse*, is a strong-growing variety, to which allusion is made below. The same firm also staged a boxful of cut blooms of *C. Excelsior*, a fine semi-double variety, of a deep purple colour, each segment being terminated by a slender white awn-like point. Mr. J. Wilshire, Beaconsfield, Bucks, contributed cut flowers of a new seedling *Perpetual Picotee*, named *Minnie*, the flowers of which are whitish, flaked with reddish-purple, and of good form. Mr. R. Dean sent a basketful of a new blackish-purple bedding *Pansy*, named *Othello*, which promises to be useful and distinct. It has been forwarded to Chiswick for trial. Mr. Dean also sent a flowering specimen of the pretty little *Primula scotica*, having farinose leaves, and a truss of bright carmine flowers with a yellow eye. It is a little gem in its way, and succeeds perfectly in a moist, shady frame. Associated with this was a group of very beautiful single and semi-double-flowered plants of *Campanula Medium*, or *Canterbury Bell*, the flowers of which were large, and of every shade of white, rose, and purple. Mr. Dean also had a large-flowered variety of *Lobelia compacta*, named *Joli cœur*, the colour being porcelain-blue, splashed with white. Mr. C. Ross, gardener to C. Eyrie, Esq., Welford Park, Newberry, sent a cut spike and foliage of the fragrant rosy-purple-flowered *Crinum amabile*, and some well-grown little plants of *Scutellaria Mocciniana*, bearing terminal clusters of bright orange scarlet flowers came from the Society's Garden at Chiswick. These plants were grown from spring-struck cuttings, and others rooted now will flower next winter. It is a bright and easily-grown plant if pinched so as to render it bushy. Mr. McIntyre showed examples of mud flower-pots, which are found to be very useful for bedding plants, inasmuch as they saved labour in spring. They were described and figured in THE GARDEN, Vol. I., p. 27. Mr. J. Bateman sent a sample of *Paraguay Tea*, the produce of *Ilex paraguayensis*, a South American form of *Holly*.

Fruit Committee.—Mr. Laxton contributed a dish of a new *Pea* named *Dr. Hogg*, said to have been plucked from a row sown on March 18th, and a fine dish of a new *Strawberry* named *Pioneer*.

First-class Certificates were awarded to the following new plants:

Clematis Grand Duchess (Cripps).—A strong-growing, large-flowered, and very effective eight-sepaled variety, the flowers of which, in some instances, were as much as 10 inches in diameter, but often only 8 inches. The colour is white slightly flushed with rose.

Begonia Emperor (Veitch).—A very robust and distinct variety, belonging to the tuberous-rooted section, having bright green leaves tinged with brownish markings and axillary clusters of large flowers of a remarkably brilliant colour. As a half-hardy decorative plant it will prove of the highest value.

Double-flowered zonal Pelargonium Wilfred (Laxton).—A free-growing dark-zoned variety, of moderate growth, bearing compact trusses of rosette-like flowers, white in colour slightly tinged with blush. It is a decided improvement on any other double white-flowered form both in habit and flower.

The following new bedding *Pansies* have received First-class Certificates at Chiswick, where they have been grown on trial during the present season, viz.:

Pansy Bedfont Yellow, *White Swan*, *Lothair*, and *Magpie*, all from Mr. Dean; *Queen of Lilacs*, *Alpha*, and *Snowflake*, from Messrs. Dickson; *Blue Perfection*, from Mr. Westland; *Dr. Stuart*, from Mr. Stuart; and *Novelty*, from Mr. Cocker.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

PLANTING OUT v. POT-CULTURE.

Most observers of indoor gardening must have seen evidence in favour of planting out, as compared with pot-culture. The tendency of our flower shows and indoor cultivation for many years past has been wholly in favour of pot-culture. At one time plants were rarely seen in good condition otherwise than in pots. Occasionally, here and there in England, one saw a superb collection of Camellias planted out, as at Bicton, Chiswick House, or the Exeter Nurseries; but, as a rule, it was pot-culture everywhere. The system answered well enough where means were abundant, and skilful cultivators were at hand. Under less favourable circumstances, the aspect of plant-houses was frequently of anything but an attractive character; and, as for the conservatory, an equal space in the nearest flowery lane in summer was a paradise in comparison. It was in conservatories and winter gardens, arranged in a picturesque manner, that we became convinced of the great advantage of planting out Palms, tree Ferns, and many other plants. The gain was great, from an effective point of view, and the saving to the cultivator in tubbing, watering, &c., was very great also. We, however, were not aware that the system was equally applicable to numbers of small plants till we saw the glass-gardens devoted to the growth of flowers for cutting in America. There the English visitor is surprised to see large houses filled from end to end with tree Carnations, Roses, Poinsettias, Bouvardias, and many other plants, which we never think of planting out in a greenhouse. It need hardly be added that the houses are, in nearly all cases, specially adapted for their occupants, for it appears that to make use of houses in this way is next to impossible in a private place, where but few of each kind may be required; nevertheless, the facts are worth bearing in mind. It may be noticed that in Mr. J. Howatt's articles on cut flower culture in the United States, written after much experience there, planting out is practised in connection with the various plants he has written on. Our note on Mr. Ladds' grove of Gardenias, planted out at Bexley Heath, will probably be remembered by some of our readers as bearing on this point. We are glad to see that the subject is beginning to engage the attention of cultivators in this country, and a very sensible article on the subject in the "Gardener" deserves a place in our columns. The writer says:—"Any means whereby a saving of labour can be effected without in any degree impairing results, is worthy the attention of gardeners in these high-pressure times, when so much is expected to be accomplished without provision for extra help. But when the results obtained, when working on this principle, are not only as good as in cases where a greater amount of labour would be necessary, but even better in all respects, then it is to the advantage, even of those who have labour sufficient for all purposes, to follow the same system. We were induced to turn many winter and spring-flowering plants out of their pots, and plant them in the kitchen-garden quarters; and, in many instances, the plants were much stronger grown than if grown on in pots. That very useful plant, *Calla æthiopica*, divided in June, and planted with some fresh soil in which to root, made splendid plants. *Spiræa japonica* does well divided. *Deutzia gracilis* and *D. crenata* fl. pl. make very strong growth planted out and treated liberally. *Brugmansia* Knighti, turned out in June, and kept drenched with water during dry weather, makes rapid progress. *Solanum pseudo-capsicum* should have the benefit of five months in the kitchen-garden—no fear of stunted plants and yellow foliage when grown thus; Violets for winter-blooming in pots may be planted early in May in a prepared bed, and lifted and potted in autumn. *Primula Sieboldi*, the early-flowering *P. denticulata*, and *P. purpurea*, may be left out until they are required for the conservatory. The double varieties of the common Primulas, and any other of the stronger-growing sorts, do well planted out and lifted in early

winter. Acacias, Cyclamens, *Prunus sinensis* fl. pl., Lilacs, and *Weigela rosea*, may all be planted out. *Dielytra spectabilis*, *Schizostylis coccinea*, or other hardy flowers used, do better planted out than kept in pots. As a means of obtaining large specimen plants of Pelargoniums of the zonal section, it merely requires the plants to be pot-bound before planting. These should have the roots cut with a spade, a portion a fortnight, and the remainder about a week, before lifting the plants. We intend planting a few of the best Cinerarias out this summer, for the purpose of getting large plants for early flowering and cutting; also some yearling Chinese Primroses, potting these latter especially into small pots. Where pits are used for raising seedlings, growing Potatoes, &c., such things as *Rivina humilis*, *Libonia floribunda*, *Eranthemum pulchellum*, winter-flowering Begonias, &c., may be planted out with advantage. As an instance of what may be done with French Beans, in the second week of February we had some sown in a sunk stove pit, and have been able to supply a dish almost daily from the third week in April; with ordinary care we expect to have a supply from these till the outdoor crops are ready for gathering. The space these Beans occupy is 24 feet by 2 feet; they have been surface-dressed once, and the total depth of soil in which they are growing is less than 5 inches. They have never been syringed, but have been freely aired, and are so far entirely exempt from the attacks of insects. If these had been grown in pots we could have looked for no better results, whilst the amount of labour required would have been much greater. The vast superiority shown by Camellias planted out over those grown in pots or tubs is pretty well known—a superiority which is not confined to the Camellia alone, but which is common to all shrubby, stove, and greenhouse plants we have seen tried. We know that the beautiful Bougainvilleas only thrive well when planted out. For climbers of all descriptions, if any returns commensurate with the trouble involved are expected, planting out into borders of more or less extent must be the means employed. We particularly mean such as *Stephanotis floribunda*, *Hoya carnosa*, *Dipladenias*, *Allamandas*, *Lapagerias*, *Plumbago capensis*, *Clerodendron Balfouri*, &c. What fertile flower-producers Zonal Pelargoniums, Fuchsias, Heliotropes, and other common flowers become when allowed space at root and room to develop at top, in any sort of intermediate house! What a wonderful display of beautiful buds the Maréchal Niel Rose gives when planted out and allowed its own will to ramble about overhead in the conservatory. The golden buds seem to turn their faces down for the enjoyment of those below. That excellent button-hole Rose, Madame Falcot, should have a part of the border for itself, and be grown as a pillar-Rose—in a mild temperature, a supply of buds will be produced throughout the winter and spring, summer and autumn. THE GARDEN has been calling the attention of its readers to the great success that Mr. Ladds, of Bexley Heath, attains with Gardenias planted out. These are free-flowering and easily grown under pot-treatment; but it seems, when planted out, there is no comparison between the two systems of growth.—R. P. B."

Beschorneria yuccoides.—This singular-looking plant is now in flower in the American garden here. It has been growing on a bank amongst Yuccas for the last seven years, and this is the second year in which it has flowered. It was introduced from Mexico when I was in the gardens at Chiswick, about twenty years ago, and belongs to the order Amaryllidaceæ, being nearly intermediate between Agaves and Yuccas. The stem, or flower-spike, is 6 feet in length, and has sixteen side branches. It branches out immediately from the base, and each branch lengthens as it approaches the top of the spike. It is peculiarly striking before the flowers open; more so than afterwards, as the brilliant crimson colour of the bracts and flower-stems gradually fades as the flower advances in growth. Generally speaking, the plant resembles a Yucca in habit, and is equally hardy here; but, of course, we do not experience the severe frosts of the northern parts of England, being close to the sea, and our winters are warmer, and the summers cooler, than even in the neighbourhood of London. Here it forms a most effective object out of doors; but the plant well deserves a place in every conservatory or winter garden.—HENRY MUNRO, *Cleavelands, Lyme Regis*. [This beautiful plant, of which we have received excellent specimens from Mr. Munro, closely resembles the *B. Tonelii*; but the last-named species has not the large brilliant crimson-coloured bracts which belong *B. yuccoides*.]

NOTES OF THE WEEK.

— PROFESSOR RILEY, the state entomologist of Missouri, who is now in London, informs us that it is a mistake to suppose that the Potato beetle is not to be feared in European countries because of the climate. From what he knows of the insect, he considers the climate of Britain even better suited for it than that of eastern America; precautions against its introduction cannot, therefore, be too stringent.

— FOXGLOVES make some parts of Kensington Gardens just now as beautiful as many spots where Nature is the gardener. We wish Mr. Gibson and his foreman, Mr. Cole, every success in thus trying to embellish with beautiful hardy flowers the dismal areas of earth which, in summer and winter, have hitherto been a main feature in our parks. There is no surer sign of intelligent gardening than having all the ground inhabited, so to say, by plants. We have no doubt the day will come when large areas of bare dug surface will not be tolerated in spring or summer; and, it cannot be too generally known, that they are as unnecessary as they are offensive.

— THE anniversary festival of the Gardeners' Royal Benevolent Institution is to take place on Friday next, the 2nd of July, when contributions in the shape of fruits and flowers, to assist in decorating the tables and rooms, will, we are informed, be duly appreciated.

— AN importation of Indian Dendrobies has recently been received by Messrs. Low, among which the beautiful *D. Wardianum* is well represented, as are also *D. Bensoniæ*, one of the prettiest plants in the genus; *D. transparens*, and the Trumpet Dendrobe (*D. lituiflorum*), all of which have been received in excellent condition.

— A PLANT of *Cypripedium superbiens*, in Mr. John Day's collection at Tottenham, is just now bearing thirty-two flowers, and is at once a most striking and effective object. Several plants of the new *Odontoglossum vexillarium* are also in flower in the same collection, as are also plants of *O. Roezlii* and *O. Warszewiczii*.

— MR. FALCONER, writing to us from Brenham, Texas, says:—Our fruit season has now begun in earnest. Chickasaw Plum trees are loaded with ripe and ripening fruit, which, although not very fit for dessert, is excellent for cooking, and coming into market so early (15th May) is very profitable. This variety grows in the poorest soil, makes fine, solitary, broad-headed trees, or forms a dense thicket or wind screen, and may be easily reproduced from suckers, which bear fruit when very young. This Plum tree stands a frost of 25° with impunity, and is so tenacious of life that I do not think cultivators pay enough attention to it.

— THE so-called tobacco-meal, says the "Kölnische Zeitung," has been successfully used for the destruction of noxious insects, but it has not yet been applied largely on account of its high price, which is caused by heavy import duty. The Prussian Minister for Agriculture has just addressed a letter to the Minister for Commerce with a view to reduce this duty, or to take it off entirely. A Hamburg firm is said to have a stock of over thirty tons of this meal.

— WE have received, from Mr. Ware, a beautiful bloom of the Showy Lady's-slipper (*Cypripedium spectabile*), which is now flowering freely in moist shady spots in his nursery at Tottenham; also a fine spike of the rosy-purple-flowered *Orchis foliosa*, being part of a tuft of thirty or forty such spikes, which are now in beautiful condition in the same establishment. Along with these, likewise, came a handsome variety of *Calochortus venustus*, and the lovely crimson-flowered single Rose, called *Rosa rugosa*, a vigorous-growing, spiny kind, furnished abundantly with foliage of the richest possible shade of green. This, and the single white Rose mentioned by us a short time ago, would contrast charmingly one with the other.

— THE Texan Peach crop is said to be unusually heavy this year, but owing to the backwardness of the spring it is nearly a fortnight later in ripening than usual. Rivers's Peaches succeed extremely well in Texas, and now (June 6th) cultivators are picking most beautiful samples of Early Beatrice, Early Louise, and Early Rivers, and that, too, before they have got a single fruit from Hale's Early, Plowden's Early, or Troth's Early. Rivers's Early Victoria ranked amongst their finest Peaches last year.

— THE following Orchids, amongst others, are now in bloom in Mr. Bockett's collection at Stamford Hill, viz.:—*Cypripedium Stonei*, with five spikes bearing in all eighteen flowers; *Masdevallia trochilus*; *Saccolabium præmorsum*, bearing three fine wreath-like spikes; *Aërides affine superbum*, with eleven spikes; *Eriopsis rutidobulbon*, one of the most distinct and effective of all Orchids, its purplish pseudo bulbs having the texture of shagreen leather, while the flowers are yellow shaded with brown, the apex of the lip being white and the column of a bright emerald green tint. Associated with these was the strong-growing *Epidendrum leucochilum*, which has just flowered, the blossoms being greenish-white, and the massive three-lobed lip of ivory-like whiteness. It is one of the largest and most distinct of all *Epidendrums*, and one which is deliciously fragrant.

THE FRUIT GARDEN.

AIR ROOTS ON VINES.

WHAT are known as air roots on Vines are the root-like growths which push from the wood above ground. They generally appear in the greatest quantity near the spurs, and less frequently upon the clean wood or stem. They usually number from two to a dozen, or even more—sometimes coming in bunches, and sometimes in rows. They resemble earth roots in some respects, but they do not often divide into rootlets; they begin to grow with the rise of the sap, and continue growing until it descends again. All varieties of Vines are subject to them, and it is often said they do no harm, which may, perhaps, be correct, so long as they are few and small, but there is reason to believe that, where they occur to any great extent, they at all events do no good. I was lately requested by an amateur to come and see his Vines, as he could not understand why he had no Grapes on them this season. I ascertained that for some years air roots had been annually increasing and the crops diminishing. This year they hang down over a foot in length, and there is not a vestige of fruit on one of the Vines. There can be little doubt that these air roots have, in a great measure, brought this about, and, if their influence in this case has been antagonistic to fertility, it may be assumed that they will always produce effects which will be more or less injurious in proportion to the frequency of their occurrence, for the nourishment which supports these roots, or other superfluous growths, is that which should properly go towards the formation of fruit-bearing wood. Air roots should, therefore, be regarded and treated as any other Vine disease. They are the production of an imperfect root action in the first place, and a damp atmosphere encourages their growth afterwards. Young Vines are not so liable to become affected as those that are middle-aged or old. Vines, on which the berries shank, generally form air roots, but they also occur on those that are quite free from this disease. Their growth is often very vigorous when the Vines are first started, especially if they are kept close; afterwards, when more air is admitted, their points get starved, and further growth ceases; where this is the case, they do not do so much harm as when they continue growing throughout the season; and this they always do if not checked in time. Cutting, or rubbing them off, when they are growing vigorously, does no good. The points do not start into growth when once broken; but a second batch is invariably pushed from the base of the first. It is as well to let those that do appear remain and grow until the end of the season, when they may be cut away with a sharp knife while pruning. Vines, with their roots in borders which are damp, or in which all the fibre of the soil has decayed, generally produce plenty of air roots, as a close adhesive soil is not conducive to the healthy development of any Vine. When air roots appear in quantity, no time should be allowed to pass without making an examination of the border. Fresh drainage, where necessary, must be resorted to; and a quantity of fibrous turf and lime rubbish is of service in sweetening the soil. After the border has been thus renewed, the atmosphere of the Vinery should be kept dry during the early growth of the Vines. J. MUIR.

Vine-rod Excrescences.—Last year you expressed a wish that I should send you some examples of these, should they reappear this season. I therefore send you one cut from where there used to be an old spur. Last year it grew upon the underside of the rod, and attained the size of a goose's egg, and when pruning the Vine I pared it completely off—in fact, I pared until I laid the wood all bare. I found six maggots in it, and probably there were more, as I cut it away in large pieces, and did not examine it very minutely. The Vine on which the excrescence appears is West's St. Peter's; it is bearing a capital crop of Grapes, and is evidently in perfect health.—DOUGLAS BROWN, Mocollop Castle Gardens, Ireland. [In our former reply to our correspondent we remarked that we were not aware of any gall of the kind he mentioned, and we assumed that it might be a gall from his mention of grubs inside it. The example he has now sent shows that it is not a gall, but merely the not uncommon excrescence arising from hypertrophy. The grubs of which he speaks can have nothing to do with its production. They will probably be the maggots of flies which have deposited their eggs in the soft excrescence. There were none in the specimen sent.—A. M.]

THE INDOOR GARDEN.

CULTURE OF DIPLADENIAS.

ALL who have a stove, however small, should endeavour to grow a Dipladenia, which need not occupy much room; when in bloom, no stove plant with which I am acquainted is more beautiful or showy. Those, indeed, who have the room, should not confine themselves to one variety, but should have three or four. In the first place, I would advise those about to grow Dipladenias to secure strong, clean, healthy, and young plants from some nursery; and, if obtained in autumn, they can be properly prepared for being started into growth, the time for doing which will depend on the time when they are wanted to flower. They will, however, require a little rest before they are started into growth, when water should be altogether or nearly withheld. If they are in small pots, give them a shift, slightly reducing the ball, and spreading out the roots, but taking care not to injure any of them. If started in November, they may be expected to bloom in June; but plants not required till the end of that month, or till July, need not be started before Christmas, and plants not started till then, and

subsequently, will, if managed properly, remain in bloom till September.

When placed in the stove, plunge the pot half-way in some plunging material, such as cocoanut fibre. About the middle of February or beginning of March, give the plant or plants, as the case may be, a final shift into 12 or 15-inch pots, and furnish them with a trellis.

Water carefully after each shift, till the plants begin to get established, and when growing vigorously they may be watered freely. From the time of starting

until now the temperature, if possible, ought to be 65° at night, allowing a rise of 10° by day with sun-heat, and, as April advances, it may be increased to 70°, and even, during the daytime, to 80°, and on very hot, sunny days, some slight shading material should be applied. Shut up the house early in the afternoon, syringe, and in hot weather keep all available surfaces moist. Great attention must now be paid to the young growths. Securing fine threads from the trellis to the roof of the stove, twist the growth once round the trellis, and give each a thread to which it may be attached; and, as the shoots grow, widen the threads proportionately till they begin to set their bloom. Look carefully after back "breaks," and assist them to lay hold of threads in the same manner; for, when well treated, they produce good bunches of flowers. Let us now presume that the plant has some fine flowers upon it, and that many more are showing themselves. If wanted for exhibition, or for moving to some other house, carefully cut the threads to which the plant will have attached itself, like a Runner Bean, and place the shoots around the trellis, arranging the bunches of bloom to cover, say, three parts of the trellis. In the course of two or three days, the foliage will be as upright, and look as fresh as if the

plant had always been trained around the trellis; it should now be taken out of the plunging material, allowed to remain where it is for a week or ten days, and then it can be taken to an intermediate house which will harden it if wanted for exhibition. Dipladenias are subject to mealy bug, and great attention must be paid to keep them clear of this pest. Therefore, examine them every morning, during the growing season, when placing the young growth around the threads. As regards soil, the best is two parts light turfy loam, two parts turfy peat, one of cowdung—two or three years old, free from worms—and one of silver sand. To this add a good sprinkling of broken sandstone, or broken crocks, about the size of nuts, according to the size of the pots to be used. The loam and peat, when broken up, should have the finer portions taken out with a half-inch sieve, retaining none but the roughest for potting. Before each shift prepare the soil, and place it in the stove a day or so previously to using it, and avoid taking the plant outside when about to shift it into another pot; on the contrary, arrange for re-potting it inside the house. The following sorts are well worth growing, provided there is convenience for doing so, viz., amoena, the flowers of which are somewhat light in colour, but are

produced in abundance one after the other on the stalk; boliviensis, a distinct kind with rather smooth foliage, and flowers very delicate in colour; crassinoda, now superseded by the following kinds—amabilis, insignis, and Brearleyana, the last surpassing all the rest in colour and texture of flower, which is rich crimson, a colour which deepens with age.

J. W.



Acalypha marginata.

Ruscus androgynus (the Canary Island Butcher's Broom).—This is one of the most effective of all climbing

plants for a conservatory or winter-garden; but hitherto it has been rather difficult to procure. Cuttings of it refuse to strike, and division is scarcely more successful in the majority of cases. It is, however, easily propagated by means of seeds, if these can be procured; and, only the other day, we saw about a hundred healthy little plants of it in the St. John's Wood Nursery, which had been raised in this way, the seeds having been imported. This plant does well at Kew, and there are fine specimens at the Crystal Palace, and also in the old Botanic Gardens at Chelsea. Its pinnate leathery foliage is very durable, often lasting fresh for two or three months after being cut. When well established in a deep rich soil, it grows rapidly, the young growth resembling that of Asparagus.—B.

ACALYPHA MARGINATA.

To the myriads of fine foliage plants which have been introduced of late years this is a welcome addition. The leaves, as regards size, resemble those of *A. tricolor*, but the markings, in which their chief beauty resides, are of a character wholly different from those of that variety. In the present case, the centre of the leaf is brown, around which is a distinct margin of rosy-carmine about a quarter of an inch in width, and the surface is entirely covered with little hairs, which add considerably to its beauty. This plant,

of which we have seen fine specimens in Mr. Williams's nursery, at Holloway, belongs to the Spurge-worts, an Order comprising upwards of a hundred species, which are more or less distributed over all tropical and sub-tropical regions, but the head-quarters of which are in South America. A goodly number are annual, but the great mass are perennial plants, having much the appearance of Nettles, and readily known in the family from their Nettle-like leaves and the disposition of their flowers.

BALSAMS.

ALTHOUGH Balsams are a class of plants much looked down upon by many, perhaps because they are easily cultivated, yet few, if any, of our summer-blooming plants are superior to them in appearance, when they receive that care and attention which they deserve. Their beautiful double mottled flowers vary from the richest crimson to the purest white, and, when well grown, will last nearly three months in perfection. In order to have them in flower in June, July, and August, the seed should be sown early in March, in a pan with plenty of drainage, and filled with light compost. They should then be placed in bottom-heat, and when large enough to handle should be potted off into small 60's, plunged in a somewhat warm pit or frame, and placed near the glass, keeping them close for a day or two till they have taken hold of the soil. Every other day they should be turned, so that they may not become one-sided, and when they have filled the pots with roots—which should on no account be allowed to become matted—they may be shifted into 32-sized pots, in a compost consisting of equal parts of turfy loam, decayed cow-dung, and fine leaf soil. In potting, the balls should be kept well down, so as to have the lower shoots as near the surface as possible. Continue to keep them in bottom-heat and near the glass without water for a day or two till the stems become used to the soil about them; otherwise, they are liable to rot. After they are watered air may be given gradually in the daytime; and, when they have got hold of the fresh soil and are growing freely, a little air should be left on all night. By this time they will be ready for their final shift, which may be into sixteens or twelves, or even a larger size, but those named are the most suitable for general purposes. When shifted the side shoots should be pegged to the soil or tied to the rim of the pot to give the plant as pyramidal a shape as possible. When they are well in bloom they may be removed to the conservatory or greenhouse, and, when the pots are filled with roots, they may have a little manure-water twice a week, and once a day after the second week. Plants treated thus will, with care and attention, attain a height of 3 or 4 feet, and nearly as great a breadth. I once saw a Balsam, shown by an amateur at Bishop Auckland, Durham, 5 feet in height and of almost equal width; it was in a No. 1 pot. The lower shoots were pegged to the soil and had taken root, the plant appearing like a large one in the middle, with five or six smaller ones around it.

Eaglehurst.

W. W.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Brooks' Liquid Carbolic Soap.—Have any of your practical correspondents used this for the eradication of red spider, thrips, and other garden pests—and with what success?—H. M.

Spiræa palmata.—According to the "Florist," three plants have borne this name:—1. The Japanese plant, to which alone it belongs. 2. A North-American plant, with rose-coloured flowers, the *Spiræa palmata* of Linnæus, and which is properly the *S. lobata* of Murray. 3. The plant figured by Pallas in his "Flora Rossica," which is properly the *S. digitata* of Willdenow; a plant of Eastern Siberia, probably extending to China also. The true plant, then, being Japanese and not Chinese, it seems most probable that the species formerly grown in this country was the latter, *S. digitata*.

The Spring Beauty (*Claytonia virginica*).—This belongs to the *Portulaca* family. Its flowers are very modest and pretty—white, star-shaped, veined with pink, the five anthers of a deeper pink of extreme delicacy. It is 4 or 5 inches high, with but two narrow leaves growing half-way up the stem. The bulb, deep in the ground, is the size and shape of a Lima Bean, and of the colour and consistency of a Madeira root. There are two or three racemes to each, bearing from eight to ten flowers. The two ovate sepals, each with a little scallop in the top (emarginate), half envelop the round seed capsule, so that it resembles a bud, and is pretty after the flower has disappeared.—MR. CARMAN in "Moore's Rural."

White-flowered *Agapanthus*.—This is not, as stated at p. 507, perfectly hardy. Even with me, in the mild south of Ireland, it has been killed by a not very severe frost, which did no harm to the common blue variety.—W. E. GUMBLETON.

THE FLOWER GARDEN.

INDEX TO LILY NAMES.

By F. G. BAKER, F.L.S.

M. C. M. HOVEY, in his recent interesting communication to THE GARDEN on the American Lilies, having expressed a wish for an index to the various species, we re-produce this paper from the "Royal Horticultural Society's Proceedings":

Alphabetical List.

The numbers refer to the species. The names to which an asterisk (*) is attached are the adopted ones, the others are synonyms.

*albanicum, 26	*Fortunei, 8	*pomponium, 34
*album, 9	*fulgens, 14	*ponticum, 27
*alutaceum, 14	*giganteum, 1	*pseudo-tigrinum, 33
andinum, 11	*glabrum, 18	*puberulum, Leicht., 20
angustifolium, 34	hematochromum, 14	*puberulum, Torr., 23
*armeniaceum, 14	Hartwegii, 24	*pulchellum, 16
*atrosanguineum, 14	*hirsutum, 18	pumilum, 35
aurantiacum, 14	*Humboldtii, 23	punctatum, Jacq., 28
*auratum, 10	isabellinum, 32	punctatum, Lem., 9
autumnale, 21	Jama-juri, 2	punicum, 35
avenaceum, 19	japonicum, D. Don., 3	*pyrenaicum, 30
Bartramii, 7	*japonicum, Thunb., 4	*Roetzlii, 24
Batisua, 3	lanceifolium, Hort., 9	*roseum, 9
*bicolor, 14	*lanceifolium, Thunb., 15	rubrum, Lam., 34
biligulatum, 14	lateritium, 14	*rubrum, Mast., 9
Bloomerianum, 23	*Leichtlinii, 33	sanguineum, 14
*Bourgæi, 21	linifolium, 35	Sayii, 22
*brevifolium, 14	*Lishmanni, 8	*sinicum, 17
Broussartii, 19	Loddigesianum, 25	speciosum, Andr., 8
*Brownii, 4	*longiflorum, Thunb., 2	speciosum, Link., 9
bulbiferum, 14	longiflorum, Wall., 3	spectabile, Link., 14
Buschianum, 14	*maculatum, 19	spectabile, Salisb., 13
californicum, 23	*Martagon, 18	*splendens, 8
*callosum, 31	*Maximowiczii, 33	staminosum, 14
*canadense, 20	*medeoloides, 12	*striatum, 6
*candidum, 6	Metzii, 2	*superbum, 21
*carniolicum, 26	Michauxii, 21	*Szovitsianum, 25
carolinianum, Cat., 13	Milleri, 18	Takesima, 2
*carolinianum, Mich., 21	minus, 22	*Tametano, 9
*Catani, 18	*monadelphum, 25	*tenuifolium, 35
*Catesbæi, 13	*nanum, 5	*testaceum, 32
*chalcedonicum, 26 and 29	*neilgherrense, 2	*Thunbergianum, 14
*citrinum, 14	neilgherrense, 2	*tigrinum, 8
colchicum, 25	*nepalense, 5	*triceps, 5
*columbianum, 22	odorum, 4	tubiflorum, 2
*concolor, 17	*pardalinum, 21	umbellatum, 11
*cordifolium, 1	pardinum, 14	venustum, 14
*coridion, 17	*Partheneion, 17	vestale, 9
*croceum, 14	parviflorum, 22	*Walkerii, 20
dalmaticum, 18	*parvum, 20	Wallichianum, Wight, 2
*davuricum, 14	pennsylvanicum, 14	*Wallichianum, Schultes
Dexteri, 10	*peregrinum, 6	fil., 3
excelsum, 32	*philadelphicum, 11	*Washingtonianum, 7
*eximium, Court., 2	pictum, 14	*Wilsoni, 14
eximium, Hort., 9	*polyphyllum, 28	*Wittei, 10
flavum, 30		

The following is a classified synonymic list of all the known Lilies, with their native countries, and references to the works where they are figured:

Sub-genus 1.—Eulirion.

Perianth funnel-shaped, horizontal or slightly drooping, its divisions broadest above the middle, spreading only towards the tip when fully expanded; filaments and style nearly straight.

1. *L. cordifolium*, Thunb.—Sub-species 1. *Cordifolium* proper.—Japan; figured in Zucc. in Sieb. Fl. Jap., fasc. 3, t. 13, fig. 2, and t. 14; Flore des Serres, t. 216. Sub-species 2. *Giganteum*.—Central and Eastern Himalayas, 5-10,000 feet; figured in Wall. Tent. Fl. Nep., t. 12, 13; Bot. Mag., t. 4,673; Flore des Serres, t. 771-2; Belgique Horticole, iii., t. 21.

2. *L. longiflorum*, Thunb.—Sub-species 1. *Longiflorum* proper.—Japan and China; figured in Bot. Reg., t. 560; Flore des Serres, t. 270; Lodd. Bot. Cab., t. 985; Bury Hexand., t. 8. Var. 1. *Eximium*.—Japan. *L. eximium*, Court., Spæ Mon., p. 14; Flore des Serres, t. 283-4. Syn. *L. Jama-juri*, Siebold et De Vriese Tuinbow Flora, vol. i., p. 319, t. 11. *L. longiflorum* Takesima, Duchartre Obs., p. 38. *L. longiflorum* Liu-Kiu, Siebold. Sub-species 2. *Neilgherrense*.—Neilgherries; figured in Wight Icones, t. 2,031. Syn. *L. tubiflorum*, Wight Icones, t. 2,033-4. *L. Wallichianum*, Wight Icones, t. 2,035, not Schultes. *L. neilgherrense*, Lemaire Ill. Hort. x., t. 353. *L. Metzii*, Steudel.

3. *L. Wallichianum*, Schultes fil.—Central Himalayas, 3-4,000 feet; figured in Bot. Mag., t. 4,561; Lindl. and Paxt. Fl., Gard. 1850, 120; Lemaire Jard. Fleur., t. 105-6; Flore des Serres, t. 612. Syn. *L. Batisua*, Ham. mss. *L. japonicum*, D. Don, not of Thunb. *L. longiflorum*, Wall. Tent. Fl. Nep., t. 29, not of Thunb.

4. *L. japonicum*, Thunb. Japan and Korean Archipelago.—Var. 1. *Japonicum* proper; figured in Bot. Mag., t. 1,591; Lodd. Bot. Cab., t. 438; Reich. exot., t. 88. Syn. *L. odorum*, Planch. Flore des Serres, t. 876-7. Var. 2. *Brownii*.—Japan; figured in Mielle Flore des Serres, t. 47. Syn. *L. japonicum*, Bury Hexand., t. 2.

5. *L. nepalense*, D. Don.—Temperate Central Himalayas; no now in cultivation. Var. 1. *Nepalense* proper; figured in Wall, Pl. Asiat. Rar. t. 291. Var. 2. *Triceps*.—Central Himalayas; not known in cultivation; figured in Klotzsch Reise Wald., t. 93. Var. 3. *Nanum*.—Central Himalayas; not known in cultivation. *L. nanum*, Klotzsch.

6. *L. candidum*, Linn. Sub-species 1. *Candidum* proper.—South Europe; figured in Bot. Mag., t. 278; Redouté Lil., t. 199; Flore des Serres, t. 735; Bury Hexand., t. 38; Reich fl. Germ., 445. Var. *Striatum* Hort; figured in Flore des Serres, t. 735. Sub-species 2. *Peregrinum*.—Never seen in a wild state, and now apparently lost from cultivation in this country; figured in Miller; Sweet Brit. Flow. Gard., ser. 2, t. 367; Hayne Arzne. 8, t. 27.

7. *L. Washingtonianum*, Kellogg.—California; figured in Gard. Chron., 1871, t. 142; Regal Gartenflora, t. 170; Flore des Serres, t. 1,975-6. Syn. *L. Bartramii*, Nuttall Herb.

Sub-genus 2.—Archelirion.

Perianth broadly bell-shaped, horizontal or slightly drooping, its divisions ovate or lanceolate, not distinctly clawed, spreading widely from below the middle when fully expanded; style declinate, and stamens much curved.

8. *L. tigrinum*, Gawl.—Japan and China; figured in Bot. Mag., t. 1,237; Redouté Lil., t. 395 and 475. Syn. *L. speciosum*, Andrews Bot. Rep., t. 586, not Thunb. Var. 1. *Fortunei*, Hort. Var. 2. *Splendens*, Hort.; figured in Flore des Serres, t. 1,931-2; Floral Mag. t. 509. Syn. *L. tigrinum* Leopoldi, Hort. Var. 3. *Lishmanni*, Moore Florist, 1873. p. 13 with figure.

9. *L. speciosum*, Thunb.—Japan; figured in Bot. Reg., t. 2,000; Zuch in Sieb. Fl. Jap., fasc. 3, t. 12 and t. 13, fig. 1. *L. speciosum*, var. *Kämpferi*, Bot. Mag., t. 3,785; Flore des Serres, t. 276-7. Syn. *L. lancifolium*, Hort., not Thunb. Stems purplish-brown. Var. 1. *Rubrum*, Masters in Gard. Chron., 1872, p. 1,522, Var. 2. *Album*, Masters l.c. Stems green. Var. 3. *Speciosum* proper. Var. 4. *Roseum*, Masters l.c. Syn. *L. speciosum*, Paxt. Mag. v., t. 1. Var. 5. *Punctatum*, Lem., Flore des Serres, under t. 277. Syn. *L. lancifolium*, Paxt. Mag. viii., t. 267, not Thunb. Var., Tametano, Zucc. Syn. *L. Broussarti*, Morren Mém. Acad. Roy. Brux., Feb., 1834. *L. speciosum* vestale, Hort. *L. eximium*, Hort.

10. *L. auratum*, Lindl.—Japan. Var. 1. *Auratum* proper; figured in Bot. Mag., t. 5,338; Flore des Serres, t. 1,528, 1,531; Ill. Hort. ix., t. 338; Revue Hort. 1867, t. 371. Syn. *L. Dexteri*, Hovey. Var. 2. *Wittei*, figured in Suringar in K. Koch Wochen. 1867, p. 294.

Sub-genus 3.—Isolirion.

Perianth broadly bell-shaped, quite erect, its divisions oblong-lanceolate, broadest about the middle, spreading in the upper half or third when fully expanded; stamens divergent on all sides from the centre of the flower.

11. *L. philadelphicum*, Linn.—Canada and Northern United States; figured in Bot. Mag., t. 519; Redouté Lil., t. 104; Lodd. Bot. Cab., t. 976; Bot. Reg. t., 594. *L. Andinum*, Nuttall. *L. umbellatum*, Pursh.

12. *L. medeoloides*, A. Gray.—Japan; not known in cultivation.

13. *L. Catesbæi*, Walters.—United States; figured in Bot. Mag., t. 259; Lodd. Bot. Cab., t. 807; Sweet Brit. Flow. Gard., ser. 2, t. 185. Syn. *L. spectabile*, Salisb. Parad., t. 5, not Link.: *L. carolinianum*, Catesby, not Michaux.

14. *L. bulbiferum*, Linn.—Sub-species 1. *Bulbiferum* proper.

—Austria, Sweden; figured in Jack. Austr., t. 226; Bot. Mag., t. 36; Redouté Lil., t. 210; Reich. Germ., t. 454; Regel Gartenflora, 1872, p. 231, with woodcut of bulb. Sub-species 2. *Croceum*, Chaix.—France, Switzerland, and North Italy; figured in Lodd. Cab., t. 784; Reich. Germ., t. 454. Sub-species 3. *Davuricum*, Gawl.—Through Siberia; figured in Regel Gartenflora, t. 740, and 1871, p. 231, with woodcut of bulb. Syn. *L. pennsylvanicum*, Gawl. Bot. Mag., t. 872; *L. spectabile*, Link; Reich. Icon. exot., t. 30; Regel Gartenflora, t. 349; *L. Buschianum*, Lodd. Bot. Cab., t. 1,628. Sub-species 4. *Thunbergianum*, Schultes fil.—Japan. Var. 1. *Thunbergianum* proper; figured in Lindl. Bot. Reg., 1839, t. 38; Maund. Bot., t. 158. Syn. *L. aurantiacum*, Paxt. Mag., 6, p. 127, with a figure. Var. 2. *Brevifolium*, Baker and Dyer Gard. Chron., 1872, p. 1,356. Var. 3. *Bicolor*, Moore Flor. Mag., t. 104. Syn. *L. pictum*, Hort. Sieb.: *L. aurantiacum*, Hort. Krelage. Var. 4. *Wilsoni*, Leichtlin. Syn. *L. pardinum*, Moore Flor. and Pom., 1861, p. 121, with a plate. Var. 5. *Alutaceum*, Baker and Dyer l.c. Syn. *L. Thunbergianum* aureum nigro-maculatum, Flore des Serres, t. 1,627. Var. 6. *Armeniacum*, Baker and Dyer. Var. 7. *Citrinum*, Hort. Wilson. Var. 8. *Sanguineum*. Syn. *L. sanguineum*, Bot. Reg., 32, t. 50; *L. biligulatum*, Hort.: *L. lateritium*, Hort. Var. 9. *Atro-sanguineum*, Baker and Dyer l.c. Syn. *L. hematochromum*, Lem. Ill.

Hort., t. 503. Var. 10. *Fulgens*, figured in Morren Spæe Mon., 29; Lemaire Ill. Hort., t. 422. Syn. *L. venustum*, Kunth Flore des Serres, t. 657; *L. fulgens* var. *staminosum*, Lemaire Ill. Hort., t. 1,422, is a double-flowered form.

15. *L. lancifolium*, Thunb.—Japan; a very little known plant, never brought into cultivation, perhaps a variety of the last. Figured in Mem. Acad. St. Petersb., 3, t. 3.

16. *L. pulchellum*, Fisch and Meyer.—East Siberia; figured in Regel Gartenfl., t. 284, fig. 2; Revue Hort., 1862, p. 131, with a figure.

17. *L. concolor*, Salisb.—China and Japan. Var. 1. *Concolor* proper.—China; figured in Salisb. Parad., t. 47; Bot. Mag., t. 1,165. Var. 2. *Sinicum*, Lindl.—China; figured in Paxt. Flow. Gard., vol. ii., misc. t. 193; Ill. Hort., t. 100; Flore des Serres, t. 1,206; Bot. Mag., t. 6,005. Var. 3. *Coridion*, Sieb. and De Vriese.—Figured in Sieb. and De Vr. Tuinbow Flora, vol. ii., p. 341, with a figure. Var. 4. *Partheneion*, Sieb. and De Vriese.

Sub-genus 4.—Martagon.

Perianth always drooping, broadly bell-shaped, its divisions lanceolate, broadest about the middle, not distinctly clawed, distinctly reflexed when fully expanded; stamens diverging much on all sides from the centre of the flower; and style declinate.

18. *L. martagon*, Linn.—Central and Southern Europe and Siberia. Var. 1. *Martagon* proper.—Figured in Bot. Mag., t. 893 and 1,634; Red. Lil., t. 146; Jacq. Austr., t. 351; Engl. Bot., t. 279, 3rd edit., t. 1,518; Reich. Ic. Germ., t. 451. Var. 2. *Hirsutum*, Miller. Syn. *L. Milleri*, Schultes. Var. 3. *Glabrum*, Sprengel. Var. 4. *Catanii*.—Dalmatia; figured in Visiani Fl. Dalm. Suppl., t. 3. Syn. *L. martagon* var. *dalmaticum*, Maly.

19. *L. maculatum*, Thunb.—Kamschatka, Manchuria, Japan, Russian America; figured in Mem. Acad. Petersb., 3, t. 5. Syn. *L. avenaceum*, Fisch. Maxim.; figured in Regel Gartenfl., t. 485.

20. *L. canadense*, Linn.—Canada, Eastern United States, and California. Var. 1. *Canadense* proper.—Canada and Eastern United States; figured in Bot. Mag., t. 800 and 858; Bury Hexand., t. 12; Flore des Serres, t. 1,174. Var. 2. *Parvum*.—California; figured in Kellogg Proc. Calif. Acad. ii., p. 179, t. 52; Regel Gartenfl., t. 725. Var. 3. *Puberulum*, Leichtlin, not Torrey.—California. Var. 4. *Walkerii*, Wood.—California.

21. *L. superbum*, Linn.—Var. 1. *Superbum* proper.—Eastern United States; figured in Bot. Mag., t. 936; Red. Lil., t. 103; Bury Hexand., t. 36; Flore des Serres, t. 1,014-5. Var. 2. *Carolinianum*, A. Gray.—Eastern United States; figured in Mich.; Bot. Mag., t. 2,280; Bot. Reg., t. 580 (not Catesby). Syn. *L. Michauxii*, Poiret; *L. Michauxianum*, Schultes fil.; *L. autumnale*, Lodd. Bot. Cab., t. 335. Var. 3. *Pardalinum*.—California; figured in Kellogg Proc. Calif. Acad. ii., p. 12. Var. 4. *Bourgæi*, Baker.—British Columbia.

22. *L. columbianum*, Hort. Leichtlin.—Oregon and British Columbia. Syn. *L. Sayii*, Nuttall mss.; *L. canadense*, var. *parviflorum*, Hook.; *L. canadense*, var. *minus*, Wood.

23. *L. Humboldtii*, Roezl and Leichtlin in Duchartre Obs., p. 105.—California; figured in Regel Gartenflora, t. 724; Fl. des Serres, t. 1,973-4. Syn. *L. canadense*, var. *puberulum*, Torrey Bot. Whipple, p. 90; *L. Bloomerianum*, Kellogg Proc. Calif. Acad., iv., p. 60; *L. californicum*, Hort. Angl.

24. *L. Roezlii*, Regel Gartenfl., t. 667.—California, Utah. Syn. *L. canadense*, var. *Hartwegii*, Baker in Gard. Chron., 1871, p. 321.

25. *L. monadelphum*.—Var. 1. *Monadelphum* proper.—Caucasus and Asia Minor; M. Bieb. Cent. Ross., t. 4; Bot. Mag., t. 1,405; Reich. Exot., t. 89; Regel Gartenfl., t. 733; syn. *L. Loddigesianum*, Schultes fil.; Lemaire Jard. Fleurs., t. 204; Paxt. Flow. Gard., t. 58; Flore des Serres, t. 507-9. Var. 2. *Szovitsianum*.—Asia Minor; figured in Fisch. & Lall. Regel Gartenfl., t. 536; Flore des Serres, t. 507-9. Syn. *L. colchicum*, Steven.

26. *L. carniolicum*, Bernh.—Lombardy, Austria, and Turkey. Var. 1. *Carniolicum* proper.—Same distribution; figured in Reich. Ic. Germ., t. 990. Syn. *L. chalcedonicum*, Linn. in part; Jacq. Fl. Austr. Suppl., t. 20. Var. 2. *Albanicum*.—Albania and Transylvania.

27. *L. ponticum*, L. Koch.—Asia Minor; not known in cultivation.

28. *L. polyphyllum*, Royle.—Western Himalayas, temperate region; not known in cultivation. Syn. *L. punctatum*, Jacquemont, Duchartre Obs., p. 77.

29. *L. chalcedonicum*, Linn.—Greece, Ionian Islands, Asia Minor; figured in Bot. Mag., t. 30; Red Lil., t. 276; Reich. Ic. Germ., t. 453 (not of Jacquin).

30. *L. pyrenaicum*, Gouan.—Pyrenees; figured in Red Lil., t. 145; Reich. Ic. Germ., t. 992. Syn. *L. flavum*, Lam.

31. *L. callosum*, Sieb. & Zucc.—Japan and Loo Choo; figured in Fl. Jap., t. 41.

32. *L. testaceum*, Lindl. Bot. Reg., 1843, t. 11.—A garden hybrid between *candidum* and *chalcedonicum*; figured in Paxt.

Mag. Bot., 1843, p. 221; Flore des Serres, t. 39; Regel Gartenfl., t. 349. Syn. L. excelsum, Hort.; L. isabellinum, Kunze.

33. L. Leichtlinii. Hook. fil.—Japan. Var. 1. *Leichtlinii* proper. L. *Leichtlinii*, Bot. Mag., t. 5,673; Ill. Hort., t. 540; Flore des Serres, t. 1,736; Belg. Hort. 1869, t. 11; Floral Mag., t. 509. Var. 2. *Maximowiczii*. L. *Maximowiczii*, Regel Gartenfl., t. 596. Var. 3. *Pseudo-tigrinum*. L. *pseudo-tigrinum*, Carrière Red. Hort. 1867, p. 410, with a figure; Regel Gartenfl., t. 664.

34. L. poponium, Linn.—Lombardy and the south of France. Syn. L. *pomponium*, Bot. Mag., t. 971; Reich. Ic. Germ., t. 991. L. *angustifolium*, Mill. L. *rubrum*, Lam.

35. L. tenuifolium, Fisch.—Siberia. Syns. L. *pumilum*, Red Lil., t. 378. L. *linifolium*, Hornem. L. *puniceum*, Sieb.

The group *Notholirion*, including L. *roseum*, Wall. (*Thomsonianum*) and L. *Hookeri*, Baker, must rank under *Fritillaria*, not *Lilium*, as it has a slender filiform stigma and tunicated bulbs, and these are the best marks of technical difference between the former and latter genus.

Meconopsis Wallichii.—Mr. Williams, of Ormskirk, is right respecting the colour of the flowers of this species, which are of a purple-blue. It is figured in the "Botanical Magazine," plate 4,668. *M. nepalensis* is the only known Indian species having yellow flowers. However, it is, of course, quite within the range of possibility that the flowers of the same species vary in colour. *M. aculeata* has rich lilac-purple flowers, and is probably the hardiest of all, except *M. horridula*, as it grows at an altitude of 11,000 to 15,000 feet in the Western Himalayas. Altogether there are six Indian species known, two of which, *M. simplicifolia* and *M. horridula*, have one-flowered radical scapes—all the others have a panicked or racemose inflorescence. The colour of the flower of *M. robusta*, the sixth species is unknown. None of them appear to grow below an elevation of 8,000 feet, and *M. horridula*, an almost stemless plant, with lanceolate, very prickly leaves, and blue-purple flowers, about 1½ inches in diameter, was gathered by Dr. Hooker at an altitude of 17,000 feet.—W. N. H.

Thermopsis montana.—This is considered by Dr. Gray to be but a variety of *Thermopsis fabacea*, which has long been favourably known as an ornamental border perennial, and from which it differs chiefly in its narrower and longer foliage and stipules. Like the older plant, it has bright yellow pea-like flowers, in terminal spikes 3 to 4 inches long, and trifoliate leaves clothed while young with silky pubescence, but glabrous in its mature growth. It is said to be superior as a garden plant to the *T. fabacea*. The seed has been received from Utah; it occurs also in California, and in the Rocky Mountains of Colorado, in bushy places by mountain streams.—T.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Dracæna indivisa in Flower in Cornwall.—This is now finely in bloom in Mr. Simmons' Nursery at Falmouth. It has been planted out ten years and is about as many feet in height. The flower-spike is about 3 feet in length, and 2½ feet in diameter, and, although but few of the flowers are as yet fully open, they emit a powerful and pleasant perfume. Of the perfect hardiness of this plant in many parts of the west of England, no doubt, I think, need now be entertained.—JOHN D. MITCHELL.

Climbing Roses after Flowering.—Your correspondent (see p. 494) will not be able to keep climbing Roses clothed with shoots at the bottom if the tops are permitted to grow unpruned from year to year. If the top shoots of *Maréchal Niel* are stopped now, new shoots will most likely break near the bottom, and thus the plants may become clothed throughout with young wood. In other respects it should be left alone. All Roses should be pruned yearly; the rampant growers, as a rule, more sparingly than others. *Maréchal Niel* ought to bloom in autumn, and generally does so, although not always, and never so freely as during the summer.—ARTHUR W. PAUL, *Waltham Cross*.

Blue Asphodel (see p. 504).—I would venture to suggest that the proper name of the plant described in Mr. Ruskin's book as a blue Asphodel is that species of *Camassia* usually known and sold under the name of *C. esculenta*, but which my friend Mr. Elwes informs me is not really that variety, but some other, the specific name of which I at this moment forget. When recently on a visit at Miserden House, I saw both varieties of *Camassia* growing side by side, and the true *esculenta* had a taller spike of much smaller and paler-coloured flowers than the variety hitherto known to me under the name of *Camassia esculenta*.—W. E. GUMBLETON.

Large-flowered Everlasting Pea (*Lathyrus grandiflorus*).—I noticed the other day, in Windsor, a line of this Pea some 15 feet in length, dividing the fore courts of houses there. It was coming into bloom, and promised to be a beautiful mass of flower. Would it not be possible to secure a cross between this, the best of the *Lathyrus* family, and our garden Sweet Peas? It is probable that whilst one would furnish perfume, the other would give increased size of flower. *Lathyrus latifolius* also deserves greater attention than it at present receives. It is one of the best porch or arbour plants with which I am acquainted, and it only needs to have its roots "kept at home" to make it annually a beautiful decorative plant.—D.

Destroying Mole Crickets.—Having ascertained the hole inhabited by the mole cricket, pour in water till it is quite filled to the top, then immediately pour on the surface of the water some oil, which, as the water sinks, will go down into the hole and effectually kill the cricket by stopping his breathing.—C.

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DESTRUCTIVE INSECTS.*

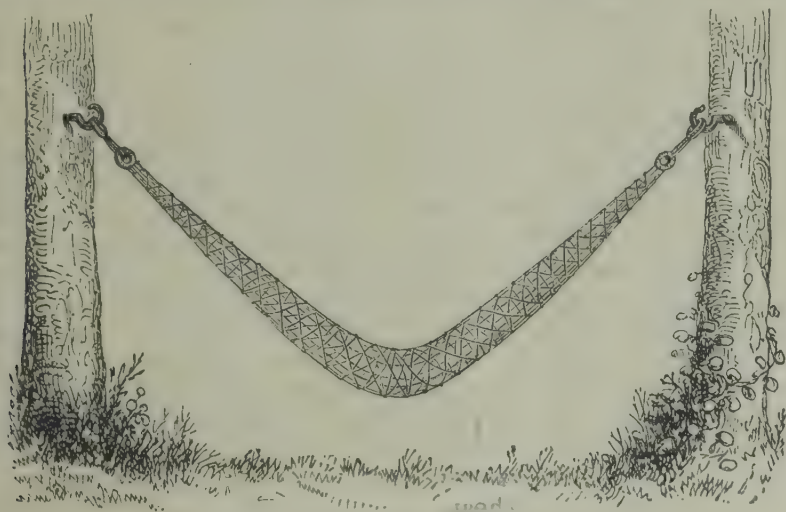
WE have already noticed this "Report" (see p. 510), so far as regards the chinch bug and the Rocky Mountain Locust; but a few additional remarks still remain to be made upon the former only, which, of the two, is the least known. The chinch bug is a small bug, named *Micropus leucopterus*. It lays its eggs at the roots of the plants, and the young, when hatched, remain for some time under ground, sucking the sap from the roots. They are at first pale yellow, turning successively into bright vermilion, and afterwards dusky in front and red behind, but in all stages having a pale band across the middle of the body. The perfect insect is usually black, with more or less of white upon the wings. It feeds almost exclusively upon Grasses and cereals, sucking their juices, and it is only when they are in great numbers that they do much mischief; but, when out in its myriads, "those who have not seen the ground alive and red with its young, or the plants black with the dark bodies of the more mature individuals; those who have not seen the stout Corn stalk (Maize stem) bow and wilt in a few hours from the suction of their congregated beaks, or a Wheat field in two or three days rendered unfit for the reaper; those who have never seen the insect marching from field to field, or absolutely filling the air for miles, can form no adequate conception of its destructive powers." Seeing that so much mischief has of late years been done by the unintentional introduction of injurious insects into new countries, through the rapid and wide-spread commercial intercourse among foreign nations, it is natural to look with suspicion upon any pest that is ravaging the territories of our neighbours. When your neighbour's house is on fire it will not do to say it is none of your business. The silk worm disease, the Vine Phylloxera, the Cabbage butterfly, and the Colorado beetle, are examples that will occur to everyone of the application of this maxim; and it may be wise to ask ourselves if there is any chance of the chinch bug coming over and settling amongst us. It cannot well come in the egg state, for the eggs are laid on the roots of the living plants underground; it cannot well come in the larval state, for the larva lives upon the green leaves of the growing plant; but it is not quite so clear that it may not come in the perfect state. Mr. Riley tells us that such as survive the autumn, when the plants on the sap of which they feed are, for the most part, so dried up or withered and decayed as to afford them little or no nourishment, pass the winter in the usual torpid state, under dead leaves, under sticks of wood, under flat stones, in Moss, in bunches of old dead Grass, or weed, or straw, or often in Corn stalks and Corn shucks. Is there, then, anything very unlikely or improbable in their passing the winter in granaries, or under heaps of Wheat or Corn, or what is to prevent their being carried over in the cargoes of Wheat that are annually imported into this country from every part of America? We can see nothing; only, the fact is that they have never come, although they have been well known for upwards of a century. The chinch bug is mentioned in the old "Records of the Revolutionary War," as prevailing in North Carolina, and Kirby and Spence made everyone aware of its destructive properties in their "Introduction to Entomology," which was published in 1828. This is reassuring; for if we have been yearly exposed to its introduction ever since grain was first imported from America without its ever coming, we may comfort ourselves with the reflection that as we have escaped in the past so we may in the future. Still, we must remember that both increased importation and increased rapidity of transit add largely to the bugs' chances, so that the fear of it can hardly be dismissed as visionary. It has not occurred to Mr. Riley to speculate on the chances of such an introduction, but he does give us his opinion upon the question as regards the Colorado beetle, which has now reached the Atlantic sea-board. He does not look upon the alarm taken by some European governments as wholly without foundation, but sensibly points out that much less restrictive measures than absolute prohibition of importation would be quite sufficient. It is obviously much less adapted for accidental transport than the chinch bug. Like it, it is only in the perfect state that its

* "Riley's Seventh Annual Report on the Noxious and other Insects of Missouri," 1875.

introduction is possible, unless some one were out of malice pre-pense to take to bringing over living Potato plants; and, in the perfect state, it passes the winter under ground, and is bigger than a horse bean, while the chinch bug hibernates in any crevice, or under any protection, and is no larger than the common bug. As our readers possibly know, Paris green is a successful remedy for this pest; but its use for that purpose has given rise to a good deal of discussion. Some regard it as injurious to the Potato plant; others as injurious to the soil; and many are opposed to its use from its danger as a poison to individuals. Mr. Riley discusses these various matters, and also the best mode of applying it. Curiously enough, the insect itself is said to be poisonous under certain conditions. Not that its bite is poisonous, but that the fumes from those that are destroyed by scalding have all the effects of irritant poisoning. The poison must, however, be present in infinitesimally small quantities, for it has been proved by experiment that individual specimens can be crushed even into a raw sore with impunity; and it is only when large quantities have been collected together and scalded that these poisonous effects have been felt. Mr. Riley's "Report" deals also with other insects besides those we have noticed, such as the canker-worm, the Apple-borers, the Phylloxera, &c.; but the principal part of it is occupied with the Colorado beetle, the chinch bug, and the locust. The work does him great credit, both as a careful observer, an accurate recorder, and able writer.

A GARDEN HAMMOCK.

A HAMMOCK well "triced up" forms an excellent resting-place on board ship, more especially in a heavy gale, but it is vastly inferior to the hammock (hamaca) of South and Central



A Garden Hammock.

America and the West Indies, which, in the opinion of those who have tried both, is a more perfect lounge than any sofa that has yet been made. These hammocks, whether made of palmetto fibre or of cotton—they are exported in large numbers from Manchester—should be fully 11 feet from "clew to clew," and when spread out laterally should have a width of quite 6 feet. Two good sized trees, about 10 feet apart, should be chosen, from which to suspend the hammock; in each of these, at a height of 6 feet from the ground, fix a stout screw-hook, having an iron thimble on it, round which the "lanyards" or ropes should be passed—this thimble preventing the rope being cut by the hook. Each end of the hammock is then suspended, and it is then lowered down until it is some 16 inches from the ground. Spread it well out sidewise, place a pillow in it for your head, and the veritable hammock of tropical America is ready for occupation. It is usual to have it lowered to within 18 inches from the ground, as you are thus enabled with a touch of the foot to set it swinging when you please. Hooks should always be used, as they render it possible to bring everything within doors at a moment's notice. A. L. T.

"La poire."—The most elegant of our flowering shrubs or small trees is the wild Shad-flower or Service berry (*Amelanchier canadensis*), a tree rarely exceeding 25 feet in height. The flowers, large and white, blooming in April and May, in terminal racemes, make it conspicuous among the yet naked forest. The berry, ripening in June, is highly esteemed by the inhabitants of British America, where it is known by the name of "La poire."—"Cultivator."

APPROACHES.

THESE, in my opinion, are often too narrow, the roadway in cases being barely sufficient for two carriages to pass each other. If one thing more than another foreshadows the style and pretensions of a mansion it is the approach, which should always be in keeping with both mansion and park. A road of less width than 16 feet is too narrow where the mansion is large and the approach of considerable length; and where the mansion is palatial in extent and appearance 20 feet is not too wide, especially if a portion of the approach can be seen from the house. In such case a narrow roadway dwindles into a mere track, which ill assorts with a grand gateway and a noble front. A modern landscape gardener and author gives 14 feet as ample width for the largest places, and 9 or 10 feet for those of moderate-size, and thinks it better that carriages should take the Grass with one wheel in passing than have the road a foot or two wider—a bicyclist would feel uncomfortable on such a track. The prospect from the front of one of the grandest residences in England is marred by an approach of this kind. From a spacious front entrance and noble gateway an approach some 12 or 13 feet wide, extending a mile or more in a straight line, appears like a mere track, and all the more so inasmuch as it runs through a level and sparsely-wooded park. In such a case, a width of 20 or 25 feet would not have been too much, and if even this had been supplemented by a clear margin of Grass 30 feet wide on each side, backed by a line of trees for half a mile from the house, it would only have corresponded fitly with the imposing structure to which it led. As regards the planting of avenues, tastes differ. Some like the trees to be close to the road, so as to over-arch it completely, which is not objectionable under some circumstances, as by planting suitable trees and pruning them properly, a pleasant leafy arcade may be formed. The Gothic arch looks best. A remarkably fine example of this kind is to be seen on an approach to a church not far from Lichfield. The road is perfectly straight for about a hundred yards, as far as I recollect, and the trees, which meet thickly overhead, have been trained by pruning into a perfect Gothic arch of considerable height, so that the avenue looks like a green cathedral aisle, with an ivy-clad church tower and porch at the end of it. When the avenue is an open one, however, the trees if there be any, should be well removed from the roadside. Rows of trees are, of course, not always necessary nor even desirable in some cases, but the appearance of an approach is much improved, and proportion better secured when the route is furnished with trees, though they may be planted irregularly. The approach to Dalkeith Park is a good example of breadth of treatment. The entrance and gateway are spacious, and the drive follows the natural level of the ground with easy recesses and curves, while the wood which lines the road on both sides is thrown back perhaps a hundred feet or more, if I remember rightly, the greater part of the way. A well-appointed equipage on an approach of this kind is a highly ornamental object, and is seen to advantage, while its occupants experience a sense of freedom, and enjoy the prospect, both of which would be marred in a roadway shut in by lofty trees on each side. Among the tall Spruce plantations in the neighbourhood of Worksop are to be seen drives that chill the traveller by their dark dreariness, though the roads are not of the narrowest description; the country, however, is flat and monotonous, and tall Spruce and Scotch Firs shut out the view on all sides. One serious objection to wide approaches is the expense of keeping them in order. The traffic only keeps the middle of the road free from weeds; hence the wider it is the greater will the amount of space on each side be which has to be kept clean. This should not, however, be allowed to outweigh the desirability of having the approach in keeping with the mansion. Cleanliness depends a good deal upon the making of the road. A macadamised road requires by far the least keeping; but many are uneasy if their approach is not annually gravelled afresh; and thus a loose bottom, and constant employment for the Dutch hoe, is the result. On one estate with which I am acquainted not a spadeful of gravel is allowed to be put on the roads, which were macadamised many years ago, and are now in the most perfect order—smooth and hard from side to side in summer and winter, and requiring exceed-

ingly little attention to keep them clean. This is the kind of road for a park; but they must be made properly at the first, or rather I should say skilfully, for it is the putting on of the metal, and not altogether its depth, which secures permanency. Now that stones are broken by machinery, road metal of the most durable kind can be had almost as cheap as gravel. In some of the ironstone districts the slag is broken up and sold for the purpose, and it is one of the hardest materials that can be employed. Macadam was able to construct excellent roads over a morass with only a few inches of broken stones properly put on. Mistakes are often committed by people unacquainted with road-making. In some cases I know of the kitchen garden thoroughfares are made 15 inches deep, with large stones in the bottom, broken stones next, and gravel above all. This makes an excellent walk, but not better than if an average depth of 3 inches only of broken stones had been put on, at perhaps one-half the expense. I have seen quite as good a walk made of sifted coal clinkers, put on 4 inches deep, and hid with a sprinkling of gravel. Whether an approach has to be kept constantly gravelled or not, it should at all events have a macadamised bottom, in which case it does not matter whether the foundation is hard or soft. Thus, supposing we had to make the road through a park of soft loam, it would be unnecessary to move more than the surface sod to a depth of 3 or 4 inches, and, having levelled the bottom evenly, and allowed it to settle where inequalities had been made up, it would only be needful to put on the broken stones to a depth of about 6 or 7 inches in the centre, and less at the sides, leaving a crown in the middle, just sufficient to throw the water off readily. The stones should be broken into pieces about 2 inches in diameter; and, in putting them on, they should be scattered, shovelful after shovelful, to the required depth, and not laid on in heaps, as is generally done by workmen; indeed, the usual plan is to empty the load in the middle of the road, and simply level it down where it lies. Trifling as this matter may appear, it is of importance; for, when road metal is laid on in hillocks—in barrowfuls, for instance—the mass is unequal in density, the small and the large pieces not being mixed regularly; and, after setting, the road becomes lumpy and uneven, an evil which is not easily remedied afterwards. A road made as here described, and of the above depth, or even less, if the bottom is somewhat firm, will naturally bear any amount of traffic for a long period of years; and for the heaviest work, from 8 to 10 inches of metal are sufficient. Of course, on an approach it will be necessary to surface the stones with clean gravel of some kind, for the sake of appearance and smoothness; but no more is required than is sufficient to fill up interstices on the surface. When the road is new the stones get kicked out by the horses' feet; these should not, however, be raked off, but pressed into their holes again with the back of a rake, and in a short time the crust will settle down to an even surface, which even the horses' hoofs will not disturb, and which will be easy to keep clean and trim. The chief utility of a macadamised surface consists in its impermeability to water; the water being thrown off at the sides, for the most part, and the bottom being kept dry, which, if soft, would work up, and be also injuriously affected by frosts; hence, the importance of making the road properly at first.

J. S. W.

Size of the Wellingtonia at Bitton.—The following measurement of my Wellingtonia may interest you. It was planted in 1855. Height, 39 feet; outside circumference of branches, 63 feet; circumference of trunk near the ground, 7 feet 6 inches.—H. N. ELLACOMBE, Bitton.

Hardiness of the Hemlock Spruce.—The common Hemlock Spruce is one of the most hardy of all evergreens, being found growing wild far into North British America, where from 30° to 40° below zero is not an uncommon temperature in winter; still this tree is frequently killed outright by 20° or 30° less cold in the gardens about New York. A very severe winter in the Middle States is pretty certain to be destructive to this naturally very hardy evergreen, consequently we must consider mere temperature as only one of the destructive agents, and not alone the cause of such losses.—"Moore's Rural."

Grafting Rhododendrons: C. T. S.—Rhododendrons may be grafted either in autumn or spring. Saddle-grafting is the best method. The grafted plants should be kept in a close house with gentle heat until the union is established, and then be gradually hardened off before planting out. We need hardly add that grafting of this kind is by no means profitable to private growers. It is one of the many things best left in the hands of nurserymen, who possess every facility for such operations; and, therefore, succeed in cases in which amateurs would most probably fail.

Pears Destroyed by Grubs: L. O.—The Pears were so injured in transit that we could not detect the grubs. Gather together all the injured fruits and burn them; unhappily there is no other available remedy.

OXFORD COLLEGE GARDENS.

THE gardens belonging to the Oxford Colleges would hardly satisfy the expectations of a gardener. If, for example, he expected to find that the "Walks of Christ Church" would lead him through borders of varied floral beauty, he might be disappointed to see no flowers whatever, save those which have been sewn by the milliner in the bonnets of the *placens uxor* who leans upon her lord the Don, or in the hat of her pretty daughter, for whom two hundred graduates sigh, when the moon is up. And when he left the grand old Elms of this Broad Walk, the handsome Planes, and the interesting Zelkond; when he had admired, in Dr. Pusey's garden, the scion of the first Fig tree, introduced into England from Aleppo, by Dr. Pocock, in 1648, and in Canon Heurtley's, the fine old Oriental Plane; when he had visited the "Gardens" of Exeter, from which our sketch is made, of Trinity, St. John's, Worcester, Wadham, and Magdalen Colleges, he would say that the title was a misnomer, and that the classic appellation of grove, or the pretty term of "pleasaunce," was more appropriate to those glorious old trees, those shrubberies, and walks, and lawns. Youth is impulsive, and in our Oxford days it brings a desire to "chivy" one's friends, ride on their backs, and roll over them, which no severity of study, no solemnity of architecture can repress, and which is very adverse to floriculture. Wherefore, ever since the Carmelite or White Friars settled themselves, where Worcester College now stands, some 600 years ago, and began to make, as Wood the historian tells, pleasant walks and groves, the gardens of Oxford have been mainly composed of trees, Grass plots, and gravel, umbrageous in summer, screened in winter, alike suitable for the constitutional, or the meditation of potent, grave, and reverend "seniors," the herbage soft, when the weather was fine, and the walks dry when the weather was wet, for their peripatetic performances, and also a suitable arena in which the juniors might disport themselves and do no harm. And yet, though the flowers are few, there is a great dignity, and grace, and beauty about these college gardens. The trees are, in many cases, magnificent specimens, and the contrast between their bright green foliage and the solid masonry of stone is very picturesque and attractive. There is every sign of care and of good taste. If we miss the brightness of the flowers, we are not offended by modern gaudiness, or by that old *barberism*, which, in the year 1628, as we see from old prints, produced the royal arms and the arms of the college, with the initials of Charles the First and William of Wykeham, done in clipped Box and Yew in the gardens of the New College. In the Botanic Gardens the gardener will find much to interest him. These were opened in 1632, Inigo Jones being the architect, and the illustrious John Tradescant the gardener, though it is doubtful whether he ever came to fulfil the duties of his appointment. Evelyn was here in 1654, and was shown the Sensitive plant as a marvellous treasure, "also Canes" (for scholastic purposes), "Olive trees, and Rhubarb." The great Linnæus came in 1736. There is an excellent collection of medicinal and herbaceous plants, and a few tolerably good examples of trees of interest; for instance, a *Paliurus aculeatus*, *Pyrus domestica*, *Salisburia adiantifolia*, *Corylus Columna*, *Gymnocladus canadensis*, *Betula pontica*, *Ornus europæa*, &c., all of which were most likely planted by Prof. J. Sibthorp, author of the "Flora Græca." And near to Oxford there is not only the nursery of Mr. Prince, famous for his Roses on the seedling Briar, but there are numerous sheltered spots in which the citizens and college servants gladden their eyes and refresh their spirits when work is over; and where some of the best specimens of the queen of flowers and others of her ladies-in-waiting are tended in their season by skilled and patient hands.

B. N. C.

Roses and Rose Lovers.—June is the paradise of Roses. In this month they break forth into unparalleled splendour. All Rosedom is out in holiday apparel; and Roses white and black, green and pink, scarlet, crimson, and yellow, striped and mottled, double and single, in clusters and solitary, Moss Roses, Damask Roses, Noisette, Perpetual, Bourbon, China, Tea, Musk, and all other tribes and names, hang in exuberant beauty. The air is full of their



AN OXFORD COLLEGE GARDEN.

fragrance. The eye can turn nowhere that is not attracted to a glowing bush of Roses. At first one is exhilarated. He wanders from bush to bush and cuts the finest specimens until there is no room or dish for more. So many Roses, and so few to see them! What would not people shut up in cities give to see such luxuriance of beauty? How strange that those who have ground do not gather about them these favourites of every sense! The air and soil that nourish Nettles and Thistles, Plantain and Dock, would bring forth Roses with equal kindness. There is enough ground wasted around country-houses to furnish root-room for a hundred kind of Roses without detriment either to fruit trees or ornamental trees. Men admire them when they see them in a friend's house; they are always pleased to receive a lapful as a present to their wife or mother or daughter; but it does not enter their head that they, too, might have Roses to give away. Roses are easy of culture, easy of propagation, requiring almost as little care as Dandelions or Daisies. The wonder is that every other man is not an enthusiast, and in the month of June a gentle fanatic. Floral insanity is one of the most charming inflections to which man is heir! One never wishes to be cured, nor should any one wish to cure him. The garden is infectious. Flowers are "catching," or the love of them is. Men begin with one or two. In a few years they are struck through with floral zeal. Not bees are more sedulous in their researches into flowers than many a man is, and one finds, after the strife and heat and toil of his ambitious life, that there is more pure satisfaction in his garden than in all the other pursuits that promise so much of pleasure and yield so little. It is pleasant to find in men whose hard and loveless side you see in society, so much that is gentle and beauty-loving in private. Hard capitalists, sharp politicians, grinding business men, will often be found, at home, in full sympathy with the sweetest aspects of Nature. One is surprised to find how gentle these monsters often turn out to be! Here is the man whom you have for years heard described, in all the newspapers, as a spectacle of wickedness or a monument of folly. You are, by some convulsion of Nature, thrown into his company and travel for days with him. To your surprise his manners are gentle, his conversation pleasing, his attention to all about him considerate. This must be artifice. It is a veil to hide that hideous heart of which you have heard so much. You watch and wait. But watching and waiting only satisfy you that this supposed monster is a kind man, with a world of sympathy for beautiful things. And when, in after months, you have been at his summer-house, and know him in his Vineyard and his garden, you smile at yourself that you were ever subject to that illusion which is so often raised about public men. A man is not always to be trusted because he loves fine horses, or because he follows the stream or hunts in the fields. But if a man that loves flowers, and loves them enough to labour for them, is not to be trusted, where in this wicked world shall we go for trust? A man that carries a garden in his heart has got back again a part of the Eden from which our great forefather was expelled.—H. W. BEECHER.

THE AMATEUR'S GARDEN.

By THOMAS BAINES.

Sowing Coleworts.—Coleworts should now be sown. The ordinary varieties of small-growing Cabbages are frequently designated Coleworts, but the true varieties of the latter are very different, and much superior for autumn and winter use to Cabbages. Their small size admits of their being planted closely and in places not adapted to the ordinary kinds of Cabbage. Coleworts are also very hardy, seldom suffering, except in the severest winters. In amateurs' gardens, where the space devoted to vegetable crops happens to be limited, there is frequently at this season an insufficiency of ground vacant for the different winter and spring crops. Where this is the case, the late kinds of Broccoli and Cabbage for winter should at once be put in a nursery bed of rich prepared soil of a loose nature, that will adhere to the roots when they are moved; in this put out the plants 9 inches asunder, giving them (if the weather is dry) a good soaking with water, and not allowing them to want it afterwards. Here they may remain for a few weeks, until ground is cleared from other crops. They will not ultimately make such large plants as those at once planted out where they are to remain, but they will do much better than such as are allowed to grow closely in the seed-bed, where they get stunted, or become weak and leggy. As early Peas, Cauliflowers, and Lettuces are over, at once clear the ground, and plant with winter crops. Amateurs will find that upon prompt action here depends a great deal of success, and in this the market gardeners may with advantage be imitated. It is no uncommon thing to see with them whole acres covered with Lettuce and Cauliflower, which in the space of a few days are swept away, and their place occupied with something else. This system of continually keeping the ground occupied without rest entails the necessity of correspondingly

heavy dressings of manure; but the advantage of much greater produce from a given space, together with its increased fertility, are all on the side of this system. Plant out successional crops of Celery, and, if the weather is dry, give it plenty of water.

Parsley.—A little Parsley should now be sown on well-prepared rich ground. Sow in rows 15 inches apart. This will not be disposed to run to seed so soon in the spring as that which was put in earlier. Thin out the early sown plants, leaving them 9 or 10 inches asunder. If this is attended to in time, there will be little to fear from canker at the root, which usually occurs when the plants are over-crowded. Where Parsley is given sufficient room, it can be kept through the winter with half the trouble, and much greater certainty, than where it is starved and weakly.

Carrots.—Thin out the principal crops of these, allowing them room in proportion to the size of the variety grown. Large-growing long kinds require more space than the small Horn varieties. A sprinkling of soot over the plants will help to keep aphides from their tops, and also grubs from their roots. Amateurs will find that there is nothing better than slight dressings of soot over most vegetable crops that are at all subject to the attacks of insects, as, independently of the manurial assistance it affords the plants, it renders them less liable to become a prey to pests of all kinds.

Seakale.—As advised early in the spring, Seakale can be grown either from pieces of the whip-thong-like roots, cut in lengths of 6 or 8 inches, which is the best method; or from seed sown early in April. If, by the latter method, the seeds are as usual put in four or six together, in rows at intervals of half a yard apart in the rows, and a like distance row from row; they will require to be thinned to a single plant in each place, and the ground between should be kept well hoed, so as to destroy weeds. By this method, in good, deep, well-enriched soil, a portion of the plants will be strong enough for taking up to force during the coming winter, the weaker ones being allowed to remain for another year. The great advantage in growing Seakale from root cuttings is that the plants have the start of those grown from seed, the greater part making strong roots the first summer. Nearly all that are allowed to stand a second season will throw up flowers, which must be cut away, or they completely prevent the plants making strong crowns; and, under any treatment, these plants that have so thrown up a flower-stem are not so good as they otherwise would be; even when cut out as soon as it makes its appearance it causes the root to form several crowns, which are individually weaker, and not so good for forcing as a plant with a single strong crown. The old system of growing Seakale in rows a yard apart, the plants being the same distance asunder in the rows, and forcing it in the bed under pots made for the purpose and covered with leaves or other fermenting material, is extravagant in every way, both as regards the ground it occupies, the cost of pots, and the amount of labour involved. Forced in this way, it also often has an earthy taste. In the cultivation of this vegetable amateurs should remember that it is a marine plant, and, like its congeners, is fond of moisture and manure of a saline character. Those who reside on the coast cannot do better than dig into the soil, where it is grown, plenty of rotten sea-weed; where this is not at hand a good dressing of refuse salt—4 or 6 ozs. to the square yard—applied through the growing season, but not so as absolutely to touch the plants, will be found highly beneficial to the crop.

Fruit.—Late varieties of Strawberries, such as British Queen and Elton Pine, if the weather is dry, should be well watered, or they will not swell off their fruit to a handsome size. Where it is the intention to prepare Strawberries in pots for forcing, as soon as runners are formed they should be layered in small pots, which plunge in the ground, or they are continually requiring water. Place the runners at a joint, on the surface of the soil in the pots, and to secure them put upon each a stone about the size of a hen's egg. All they require until they are well rooted is sufficient water to keep the soil moist.

Peaches and Nectarines.—Go over these, and if the fruit is still too thick, remove more, as also superfluous shoots, but, on no account, take away too much leaf, for, in the season, this is worse in its effects upon the trees than the opposite extreme of neglecting to dis-bud them. Continue to use the garden engine or syringe regularly two or three times a week, wetting the undersides of the leaves. If this is attended to, little injury will be done by thrips and red spider—the worst enemies these fruits are affected by, and which not only materially injure the present crop, but weaken the trees, thereby seriously affecting them in after years. These fruits will be benefited by mulching the ground with half-rotten dung. This is easily applied where the borders are not cropped with anything over the roots. Where Strawberries are grown on a Peach border the mulching they have received will assist to keep the soil moist.

Asters and Stocks.—Successional plants of these may be planted out, and by putting in a later batch the bloom may be kept up further in the season. Asters, especially, are so useful for

cutting that it is desirable to have them as late as they can be had. Bi-annual stocks of different colours, especially purple and red, should at once be sown. These fragrant plants are not so much grown as they deserve to be, although their culture is very simple, requiring nothing more than to be sown in ordinary soil, and as soon as large enough, pricked out in patches of three or four in the herbaceous borders, or where they are wanted. Wallflowers, Sweet Williams, and Foxgloves may yet be sown, and if well attended to will make fine plants for next year. Dig and afterwards rake the soil quite smooth; then sow the seeds thinly, covering them slightly with sifted soil; if the weather should be dry, water with a fine-rosed pot, so as not to wash the seed bare. Afterwards keep the seedlings sufficiently thin in the bed to allow them to grow stout, and keep them clear from weeds.

Lawns, &c.—Where there are many Dandelions and Plaintains, and they were got out earlier in the season, they will again spring up, and should be at once cut. By constantly operating on them, they will gradually die off. The late showery weather will cause weeds to make their appearance on walks, and advantage should be taken of the gravel being softened by the rain to hand-weed, which can be done more easily when damp than at any other time.

Roses in Pots that have flowered under glass, and are now turned out-of-doors, should be well attended to, for upon this depends their capacity for flowering well next season. These plants, if well-managed, will go on improving for a number of years. After blooming, if they require larger pots, they should be shifted on; good yellow loam, made rich with rotten dung, being used, with the addition of sand in keeping with the nature of the soil. Any that do not require potting will be benefited by the surface-soil being replaced with an inch or two of new. They should then be plunged out of doors in an open situation in coal-ashes and regularly attended to with water; whilst making active growth, they will be assisted by the application of manure-water once a week. Keep them clear from aphides and red spider by using the syringe frequently; and should mildew make it appearance, dust them with sulphur, or syringe with water in which flowers of sulphur has been mixed and well stirred. Two ounces to the gallon is a good proportion, and the mixture should be allowed to stand for a couple of days; after which it can be used in a clear state. It is particularly necessary to keep this parasite in check during the summer season on pot Roses; for, if allowed to take possession of them, it not only does them much harm, but is sure to appear as soon as the plants are started during the coming winter, at which time it will be much more difficult to deal with. Roses that have got well established in pots, and are properly attended to in the manner described, will flower much more satisfactorily than those that are forced for the first time.

Flower Garden and Pleasure Grounds.

The late copious rain-fall has been of much benefit to recently-transplanted trees and shrubs, as well as to newly turned out bedding plants; and the soil in most cases will now be found to be favourable for the pegging-down of Petunias, Verbenas, and similar plants. All such trailers may be fastened to the soil with facility by means of short pieces of bast, which, after being passed round the shoot, should be thrust into the soil with a wedge-like pointed stick; an operation which should be persevered in as the plants continue to grow, until the surfaces of the beds are fairly covered. In all cases, when pegging-down is inapplicable, let the plants be supported when necessary by stakes. Box-edgings to walks and drives may still be cut; and, where edgings consist of any other kinds of plants, such as Daisies, Thrifts, &c., they may now be cut in, or otherwise reduced to any desired extent. Edgings of Grass should be frequently mown, and, on each occasion, should have the edging shears applied, to prevent the Grass from growing into the gravel. Where walks, however, happen to wind through dense masses of shrubs, or under the shade of trees of any sort, it is always difficult to keep Grass, or edging plants of any kind, in a healthy condition; and, in all such cases, it is advisable to use an edging-tile of some sort, which, having generally a neat appearance, is much to be preferred for such situations to an edging consisting of unhealthy plants. Keep the surface of gravel walks free from weeds of all kinds. Moss may generally be eradicated by giving a good dressing of salt, which, on some kinds of gravel, not only appears to give increased solidity to the walk, but also improves its colour. Should the walk, however, be edged by turf, or plants of any kind, care must be taken to prevent the salt from coming in contact with them. To be safe, indeed, it should not be placed closer to them than from 6 to 9 inches. A period of dry, hot, settled weather should also be chosen for the application, or it will have little, if any beneficial effect. Sow the various kinds of Brompton Stock and German Wallflowers—if not already done. Wallflowers come quite double from seed; but, where it is desired to

increase the finest kinds, cuttings should be employed, and put in now, under hand-glasses, in a shady situation. All spring bedding plants should have what little attention they require, in order that they may be found in thoroughly good condition when they will once more be required to furnish the flower-beds. If old plants of the various species used for this purpose were carefully divided when they were removed, and afterwards planted in the reserve garden, all they will now require will be an occasional supply of water during dry weather, and the keeping of the soil in which they are planted free from weeds, &c. If this division, however, did not take place then, it ought to be attended to now, or as soon as possible; and old plants of such species as the Arabis, Aubrietia, Daisy, the variegated Dactylis, Helleborus, Hepatica, Myosotis, Primula, Saxifraga, Sedum, the variegated Tussilago Farfara, Violas, &c., should be carefully divided into small portions, which should be planted in good, light soil, well watered, and shaded for a few days, should the weather become hot and dry. This may be effected by inserting among them a few twigs of the common Laurel, or similar material, which should be removed as soon as the plants have become established. Treated in this manner, they will soon become fine plants, and when required in the autumn will be found capable of producing an immediate and desirable effect in the flower garden.—P. GRIEVE, *Culford, Bury St. Edmunds.*

Indoor Fruit Department.

Vines.—If not very carefully looked after now, red spider will quickly multiply, for no kind of weather is more favourable to its increase than that which usually occurs in July and August. Dryness at the root often assists its development more than dryness in the atmosphere, and Vines on light soils are more liable to be affected than those in moist stiff loam. It is, however, bad management to allow the pest to develop from excessive dryness; and unprotected outside borders, filled with roots, must be well watered, for, where the bottom rests on plenty of drainage, the soil becomes quickly parched. Where rough manure is not regarded as unsightly, the surface of the border may receive a coating to the depth of 6 inches or more of this material in a moist state; and the soil may then be forked over, and left, rough water being applied plentifully after the manure has been laid on. This may be done with advantage to all Vines bearing fruit, excepting those upon which it is ripe, or nearly so. When the soil is somewhat exhausted, the manure is of assistance in perfecting the crop, especially where it is at all excessive. All young Vines, planted at any time this season, will have their roots very near the surface. The slightest check in any form will be injurious to them for years to come. Pot Vines intended to supply the earliest fruit next spring, should now be widened out, and placed in a position where they will be fully exposed to the sun throughout the greatest part of the day. It must not be thought because the growth of the Vines is perfected, that insects may do as they like, for to neglect them now is to undo what has already been done. On very hot days, it is often necessary to water Vines having their pots well filled with roots, twice or three times a day. The foliage should never be allowed to flag for want of water.

Pines.—Avoid a strong artificial heat in any Pinery when the sun-heat becomes powerful early in the morning. A small fire lighted at 8 p.m. and allowed to burn out prevents the temperature from falling below 65° throughout the night, and more than this is not necessary. Provision should be made for taking off and potting the general stock of suckers. Plenty of fibrous loam should be broken up, and whatever plunging material is to be used should be placed in a convenient position for using. Be careful to shade fruit almost fully swelled, or it may ripen prematurely and be wanting in juice and flavour.—J. MUIR.

Action for Damage Done by Fowls to a Garden.—At the Bloomsbury County Court the other day, before the presiding judge, the case of *Beaman v. Cummings* was heard, in which the plaintiff, residing at 53, Lawford Road, Kentish Town, sued the defendant, residing at No. 55 in the same road, for damage done to flowers in the plaintiff's garden by the trespass of the defendant's poultry, and for money paid by the plaintiff in respect of the following particulars—namely, 5½ dozens of choice Carnations, costing £2 6s., and 18s. damage done to the plaintiff's garden, and for the gardener's time in replacing the same. The defendant said every precaution had been used by him to restrain his fowls, but even if any damage had been done, 8d. each for a common flower like a Carnation was a preposterous price. The judge thought this was not so, and was of opinion that, as the defendant had not properly restrained his poultry from committing depredations, he must pay for the damage done. Judgment was accordingly given for the full amount claimed with costs of attorney and one witness.

"SPORTS" IN PLANTS.

MR. C. M. HOVEY, the able and experienced horticulturist of Boston, has had something interesting to say on this subject to the Horticultural Society of Massachusetts. He says—"What is a natural sport? To most horticulturists and cultivators of experience this may appear a simple question, but by numbers of persons it is not so well understood. A natural sport is a variation or peculiar change of any part of a plant from its normal state. Take for instance the Camellia, or Japonica, as it is often called. Here we have the old Double White (*alba plena*), a Chinese variety, imported into England so long ago as 1739, and since then extensively propagated and disseminated all over Europe and America. Yet it is still the very same flower it was in 1739, so far as we know ourselves, or can learn from descriptions, paintings, or books. It has never been anything else. If, however, you or I had a plant which should, upon one particular branch, show a flower of a different form or colour, that particular flower would be denominated a 'sport.' So, too, if the leaves were to assume a different shape, or the branches some peculiar form, that would be also a sport, because, in either instance, it has departed from its original type. Such a flower or branch is, therefore a 'natural sport,' and so considered in these remarks. It is somewhat extraordinary, when we notice the character and importance of these sports, that so little has been written upon the subject. In the very hasty manner in which I have been enabled to look through the works of various authors I find that it is scarcely mentioned at all. Mr. Knight, in his numerous physiological and horticultural papers published from time to time in the 'Transactions of the Royal Horticultural Society,' does not speak of sports. Loudon, in his various exhaustive volumes on trees, plants, and shrubs, has little or nothing to say of them. Lindley, in his 'Theory of Horticulture,' does not notice them, and M'Intosh, Thompson, and other authors, do not give us any information upon the subject. Indeed, it is only in the periodical works upon horticulture, and scattered through many volumes, that much can be learned, and this in the main recorded of only a few particular sports. When we reflect a moment upon their importance, and consider how much our pleasure grounds and gardens, our greenhouses and conservatories, have gained in valuable additions through these sports, we are surprised that so little has been treasured up regarding them. The fact that we know so little of the cause of these sports is probably the reason why the record of their production is all that can be found. It is only within a few years that they have assumed any prominence, though, undoubtedly, they have existed for a long period. The very curious variegated trees from Japan, though probably some are from seed, are, many of them, undoubtedly sports, for it is not probable that so many seedlings should be precisely like the parent, except in the colour of the leaf. Loudon, in describing one of the very dwarf forms (*Abies clanbrasiliana*) of the Norway Spruce, states that it was said to have been found at Belfast, but, he remarks, that to him "it was very doubtful whether such a stunted variety as this was ever found in a bed of seedlings; we think it more probable that it is a continuation by cuttings of one of those bird-nest-like monstrosities that are occasionally found on all trees;" in reality, a sport, though he does not use that word. As we have stated, little can be learned about sports in books, and we are driven to form our own conclusions regarding them. That they do take place on original plants there is no doubt, but it would seem that this tendency to sport is greatly increased by continued reproduction from seed. We have stated that, so far as we know, the old Double White Camellia has, in nearly a century and a half, never sported. Yet, when we look at that incomparable and most exquisite of all flowers, the Camellia fimbriata, a perfect counterpart of the Double White in leaf and form, except that its petals, pure as the driven snow, are as delicately cut as the most delicate of fair hands alone could cut them, throwing a charming fringe around each petal, we think this, too, was a sport saved by some observant and enthusiastic cultivator of the Flowery Kingdom, and bequeathed to us as a token of the care which that heathen nation has ever bestowed upon one of the most beautiful handiworks of the Creator. The Azalea is another Chinese plant which, at the present day, is the most "sportive" of all that we possess; in fact, it has become so to such a degree, that a name signifies but little. Sometimes the flowers of striped varieties are all white, sometimes red, and at others parti-coloured, and many of our varieties are perpetuations of these sports, some of which continue true and others go back to the original. As to the cause of these sports we have little to say. Our only theory is that, having undergone so many cross fertilisations, they have become, as we often say, "somewhat mixed," for the older varieties of the large-flowered, or rather large-leaved kinds, of the Phœnicea and alba type remain very true, and sports among them are exceedingly rare—indeed, we ourselves do not know of one. I trust that the few instances I have mentioned of the origin of

sports will show you the importance of observation. No doubt many interesting additions might have been made to our variety of plants, had the cultivators of fifty years ago been as numerous or unremitting in their labour as those of recent years. The number now who are on the look out for every sport is legion, and the yearly additions to our catalogues show that they are not idle."

POSIES FOR THE POOR.

"A GOOD SUGGESTION.—A correspondent writes to us:—'At this season, when all the gardens are full of the loveliest and sweetest blossoms, there are—as at every season—hundreds of poor people in our London Hospitals with whom time passes very heavily, and whose sad, sick hearts would be cheered beyond measure by the sight and smell of our commonest garden flowers; and there are, I am equally sure, hundreds of kind-hearted men of business who would willingly bring up each a bunch of flowers, once or twice a week, to town, and drop them into a large basket placed conveniently at the railway station. Each hospital might have a basket, or the flowers could be shared out from a big one. Nearly every hospital is close to a station. Many poor sick people—regular Cockneys—hardly know what a flower is.'"

"Splendid bouquet you've got," cried young Citizen Brown
To old Citizen Briggs, in a train up to Town.

"Some young Party this evening to take to the play,
Or a ball? Mr. Briggs, Sir! I say, Sir, I say!"

Said his elder, "It isn't at all what you think;
So you've got no occasion to smirk and to wink.
I am not a young puppy—these bristles are white—
Home and early to bed is my custom at night.

"No; these flowers from my greenhouse and garden will go
To a place where they'll serve more for use than for show;
To a hospital ward, where the Lily and Rose
Will improve the condition of things for the nose.

"A suggestion of late in my paper I read
Of this cheap contribution to cheer the sick bed.
As a thing to be done, Sir, my fancy it caught,
So in practice, you see, I've put *that* happy thought.

"The smell of Syringa, Carnation, and Pink
May help raise up the spirits which in sickness sink,
And Geranium, and Scabious, and Lychnis, supply
Some refreshment for many a poor patient's eye."

"Mr. Briggs, Sir," said Brown, "the ideas you impart,
They do honour alike to your head and your heart:
You experience, of course, that enjoyment which should,
And does, I have no doubt, attend doing good.

"I remember some rhymes upon acts of the just
Say they smell sweet and blossom, although in the dust;
And your nosegay, for hospital patients designed,
Though I can't quite repeat them, has brought them to mind."
—"Punch."

THE POWER OF SOIL, AIR, AND VEGETATION TO PURIFY SEWAGE.*

By ALFRED CARPENTER, M.D.

I HAVE taken the subject of the practical power of soil, air, and vegetation to purify the sewage of towns for our consideration as distinguished from that which may be called the theoretical view of the question. It is acknowledged on all hands that the filtration of sewage, however concentrated, or however diluted through soil, will effectually remove all the objectionable matter which is contained in the water; that is, filtration will remove all organic matter from the water, and allow it to pass away perfectly purified, provided the filtration is continued long enough or the filter renewed often enough, and the thickness of filtering material be fairly adequate for the purpose. The theory of sewage purification by soil is the foundation of sewage irrigation, but the power of soil is not everlasting; its power to extract organic matter has a limit, and if the action of the filter be continued after that limit has been reached, there is a cessation of purification, and nuisance and its contingencies are inevitable. The water which passes through the filter may be absolutely less pure than before filtration was effected. Soils, however, vary in their power to abstract organic matter; some being more competent than others to effect the object in view; some are powerful enough to purify water if it passes through a foot or two of material, as is the case in the ordinary water-filter; others do comparatively little, and soon lose their virtue by saturation. I am not, however, about to discourse upon the capacities of soils, but simply to ask you to concede the point, and then conduct you to the second term of my proposition, viz., the power of air to assist the process. If a filter is continuous in its operation it soon fails, but if its action is inter-

* Paper read at a monthly meeting of the Association of Medical Officers of Health.

mittent, if the soil in use is allowed to run dry, and the interstices which naturally exist in it, and which, whilst in action, are filled with water—if those interstices are allowed to become re-charged with air, the power of the filter is restored, and purification is again effected. There is an oxidisation of the organic matters contained in the interstices of the filter; the arrested organic matters become organic salts, and pass away when the filter is used again, dissolved in the water as nitrates and nitrites, and, if looked for, afford evidence of a so-called previous sewage contamination. In themselves they are harmless in the quantities in which they are usually found in filtered water. This is the principle in operation in the plan which is now finding favour under the name of downward intermittent filtration. The organic elements in the sewage, which are dangerous in their recent form, are changed into harmless salts and are comparatively lost to cultivators. It tends to produce in the long run an imperial bankruptcy by casting away into the sea a valuable matter which has to be recouped to us as a nation by purchases from other countries. Still, intermittent downward filtration effects a present object, and can be made applicable for the purpose of purifying sewage in those places in which it is found impossible to bring to bear upon the matter the third term of my proposition, and which is the most powerful agent of the three in the series, viz., vegetation. A filter requires rest to allow of the access of oxygen for the purposes of oxidisation, but the true principle of sewage utilisation is, for that oxidisation not to take place at all, but that the organic matter which is arrested by the soil should be taken up into its natural storehouse, made to revert into the formed material of plant-life at once, rather than to change into a chemical salt which has to be decomposed again by the vital power of the plant, re-absorbed into its juices, and so brought back to organic life by a roundabout process, instead of that direct one which Nature provides; for there is no doubt that plants infallibly extract every particle of matter of organic origin existing in the atom which has nitrogen in its composition, that passes within reach of their rootlets. It will thus be observed that I have considered my communication to be one which is to show the practical power of soil and air combined with vegetation to purify sewage. Analyses give no countenance to the idea that land will in time become sick of sewage, provided the proper weight of crops is taken from it, as compared with the amount of sewage which is passed on to a given area. If fifty tons of produce are annually obtained from every acre of land upon which 5,000 tons of town sewage have been poured, a ton of produce for every 100 tons of sewage, it will be found that a proper balance has been struck, and all manurial matter has been extracted which is at all likely to be obtained. It is found, however, in practice, impossible to get the fifty tons a year. The produce of Rye Grass land gives on the average about forty tons per annum; and, at the end of three years, the land is broken up and planted with some other crop, as Mangold, or Cabbage, or both, or it is market gardenized, and during the time it is thus cropped the sewage is sparingly applied. Thus the fresh cropping takes out of the soil the matters which were not abstracted by the Rye Grass, and the balance is restored without the possibility of danger arising to the health of the district around. I wish it, however, fairly to be understood that I do not advocate the use of effluent water from sewage land as household water, but I do contend that it may be admitted into any watercourse without injury to the residents, and without damage to fish. The commissioners on pollution of rivers propose to allow any water to go into a running stream which does not contain more than two parts by weight of organic carbon in 100,000, or '30 parts of organic nitrogen. I have a report of the examination made of effluents from most of the sewage lands in the kingdom, from which it may be seen that in every case the water has complied with the conditions laid down by the commissioners. Let us now refer to the financial returns. We have about 460 acres of land under cultivation. The valuation, as to produce, which was made in March last year, was £4,732 2s. 9d. The valuation now is £5,020. During the past year we have received in hard cash £7,256, which, with present valuation, gives a return of about £20 per acre, as obtained from the land by sewage cultivation, not allowing for working expenses.

Dr. Letheby, in opening the discussion on this paper, thought that Dr. Carpenter had disposed of three great questions in somewhat a too charming and easy manner. The three great points to consider were the power of vegetables to assimilate organic manure. The safety in case of sewage-grown vegetables, and the nuisance arising from the vicinity of sewage culture. Whether organic matter must pass into the mineral stage before it regains the vegetable state is a question, and the power of the plant to utilise organic matter is a most important one.

Dr. Voelcker: It is a very important question whether vegetable life is sustained by organic or mineral food. At one time humus or the organic matter in soils, was regarded as the sole source of

terrestrial food of plants, but the humus theory, which has done so much mischief in retarding progress, he thought, had received the final death blow by the wonderfully clear and most conclusive argumentative writings of Liebig, and he quite agreed with that great chemist; but the luxuriant development of the crops usually grown on cultivated lands depended mainly upon the available mineral food present in the soil, and not on its organic matter—indeed, he did not know a single fact which supported the view according to which plants live and grow vigorously upon the organic matters of the soil or manure, and not upon the mineral portion of the soil or the saline and mineral constituents of the manure. It had been established beyond controversy that the really essential elements of plant food were mineral and not organic substances; and he was decidedly of opinion that the constituents of sewage had to become mineralised before they could benefit growing crops. In porous and well-drained soils, and in land readily permeated by atmospheric air, the conversion of organic refuse matters into purely mineral compounds proceeded with great rapidity; and this, by the way, was one of the causes why sewage culture succeeded better on light land resting on a porous sub-soil than upon stiff clay soils upon imperfectly drained sub-soils. On stiff clay land the decomposition of the animal refuse matter proceeded much more slowly than upon porous, light, and sandy soils. Hence it was that heavy clay land was generally manured in autumn, whilst light land was more beneficially manured in spring; for if ordinary farmyard manure were applied to the land in spring on stiff clay lands, there would not be sufficient time to convert the manure into mineral elements of plant-food, and light crops would be the result. He would further state in support of this view, that on soils not readily penetrated by air, organic matters were positively injurious, and the healthy and vigorous growth of all produce, and the destruction of organic matter, and the production of available mineral plant-food in porous soils, proceeded with great rapidity. He would quote in proof of this the interesting experiments of Boussingault and Léwy, who had shown that the air in a cultivated soil invariably contains less oxygen than the air above it. A portion of the oxygen in fact was consumed by the organic matter in the soil, and its place was taken by carbonic acid, resulting from the combination of the carbon of the organic matter with the oxygen of the air. According to the nature of the soil and the time of the year, and the way in which it had been treated as regards manure, the amount of carbonic acid in the air of the soil may increase to over eight per cent. and that of oxygen recede to less than twelve per cent., and invariably it is less than twenty-one per cent. by volume. For instance, on analysing the air present in a light sandy soil, recently manured and after rain, Boussingault and Léwy found:

	By volume.
Carbonic acid	9.74
Oxygen	10.35
Nitrogen	79.91
	100.00

In another sandy soil, unmanured, the air contained:

	By volume.
Carbonic acid	0.93
Oxygen	19.50
Nitrogen	79.57
	100.00

These experiments show plainly that common dung and similar refuse matters are really burnt up or oxydised in porous soils with great energy, and rapidly converted into mineral plant-food. In another experiment the same chemists found in the air in a stiff clay soil:

	By volume.
Carbonic acid	0.66
Oxygen	20.04
Nitrogen	79.30
	100.00

Showing that here the combustion of the organic matters in the land proceeded more sluggishly; and, I may add, on such land the produce is generally more scanty than on a porous well-aërated soil, plentifully supplied with mineral food, amongst which I include nitrates.

Dr. Corfield agreed with Dr. Carpenter in everything he had stated almost entirely. Dr. Carpenter had been moderate in quoting from analysis, because in many cases the soil contains more nitrates than were given. In winter plant life was at its lowest; and in no case was the effluent water in such a satisfactory state in the spring before vegetation was in the most active state. We have first to purify the sewage and to oxydise whatever ammonia remains from the plants. If the water passes over the soil, you cannot be sure in winter that the water has been purified. There is plenty of time to oxydise all sewage matter if it passes through the soil. With regard to the

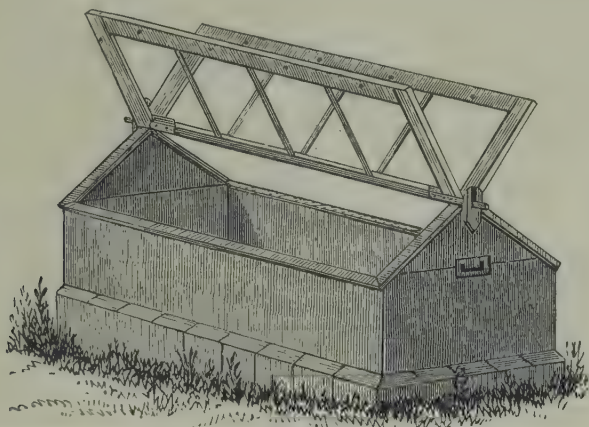
imputed nauseous character of sewage where it is passed through the ground it has not been found offensive.

Dr. Letheby: One of the prime elements to consider is the fitness of the soil, the quality, quantity, and time that sewage is put on. It is commonly supposed that any soil will do for sewage, but that is a mistake. Purification is due not to the soil but to the absorbing character of the roots of plants; some say, therefore, that a clay soil is the best for purifying purposes, and others argue that a light silicious soil is the fittest. These are practical considerations, and in discussing them we should know all the circumstances.

Dr. Carpenter, in reply, said, I have proved that plants can live on organic matter by experiments I made in feeding some with beef tea, on which they thrive beautifully, and immediately; whilst those plants fed with mineral matter required time. I passed over the subject of soils, which is an important subject, but that of vegetation is more so. Damage, danger, and nuisance, are ideal terms, not facts. Our land takes the sewage of 165 persons per acre, and I challenge anyone to eat the produce and give any adverse criticism that will bear testing. Sewage culture requires great attention and care as regards details; but, if properly done, it presents a scientific solution of the sewage problem. As to filtration, it is necessary to do this on clay lands in winter; but it is also necessary to have crops in a proper state to assimilate the sewage. We have been flooded on the breaking up of frosts, but that is a common occurrence in many places. With regard to the death-rate of the district; the population in close proximity has been rapidly rising, and 15·7 is not high considering the want of water and other circumstances. In some of the surrounding parts the water supply is so bad from impure wells that the poor prefer taking our effluent water. Lastly, with regard to the detriment of property, an acre of land adjoining that to which sewage was applied was recently sold for £1,095. A few years since land close to it was sold for £100 per acre.

AN IMPROVED GARDEN FRAME.

THE accompanying illustration represents a handy little garden frame, which cannot fail to prove useful, not only to amateurs, but also to professional gardeners. It was introduced to my notice by Mr. Mitchell,



An Improved Garden Frame.

gardener at Knossington Hall, near Oakham, who informed me that he has found such frames extremely handy for protecting seed beds, winter vegetables, and spring flowers. They measure 4 feet 6 inches in length, and 3 feet in breadth; one of their chief merits consists in the sashes being moveable. As shown in the illustration, they are hinged at the back, and may be folded together like the cover of a book, and lifted out of the grooved supports if desired. The glass is inserted entirely without putty, and iron sash-bars may be used instead of wooden ones, which conduces somewhat to their durability. These useful and convenient little frames are the invention of Messrs. Anderson & Waite, of Melton Mowbray.

B.

Budding Standard Thorns.—In hedgerows, where it is desirable to form standard Thorns, the present is a good time to commence the preparatory work by driving in long, stout stakes, to which two or three of the best shoots may be secured, and, if sufficiently long by the autumn, they may be budded with the different improved kinds, amongst which are Paul's Scarlet and the variegated-leaved single white, which makes a charming scented object, its silvery leaves enhancing the beauty of its appearance.—CHEVALIER.

Turf Plant for Hot Countries.—A new turf plant, for hot, dry countries—*Lippia ægyptiaca*—is favourably spoken of. M. Delchevallerie, an experienced gardener who lives in Egypt, was surprised on seeing the verdure of this plant, which he met with on one of his excursions, and he planted it in the gardens under his care. It spreads rapidly, rarely flowers, and it is of a beautiful dark green. Hot and dry countries are, however, by no means badly off for plants that cover the ground with green in summer; the Ice Plants and green Sedums have been proved to answer admirably for this purpose in the sunniest parts of Italy.

THE KITCHEN GARDEN.

THE NEW POTATO DISEASE.

ON the first appearance of curl in the leaf of my Snowflake Potatoes, I felt no alarm, as I considered the evil to be only of a temporary character, but, on seeing the leaves decay and drop off, I bared the stems down to the sets, where I found a small cluster of young Potatoes attached to the base of the stem, the largest being about the size of a Broad Bean. The stems looked black, and appeared to be fast decaying, and around some of them, clustered in great numbers, a spider-like insect. Growing side by side with the Snowflake are the Eureka, Brownell's Beauty, and Compton's Surprise, a pound weight of each of which was planted on the same day, and all treated alike in every respect; Brownell's Beauty and Compton's Surprise have shown slight symptoms of curl, but no decay; Eureka is growing with a rapidity and vigour rarely observed in any Potato; and such plants of Snowflake as have escaped disease are also growing with great vigour—in short, nothing can be said in praise of this Potato which it does not deserve. Its appearance above ground is simply perfect, and I would fain hope that the disease which now threatens it is local rather than constitutional. The Early Rose and Eureka are the only two American varieties with me that are entirely free from curl. Bresee's Peerless, a most vigorous grower, showed symptoms at one time of becoming much affected. I hear from different cultivators, who have reared sets of Snowflake in pots, that no symptoms of disease have shown themselves in their case (see also p. 491). Like myself, they planted their sets out in the ordinary way, in the early part of April. The plants belonging to one grower (an amateur) have wholly disappeared, like those referred to in the Horticultural Society's Gardens at Chiswick.

Alnwick.

J. T.

I herewith send you two specimens of what seems to be a kind of Potato disease—perhaps the one referred to in your "Notes of the Week" (see p. 500). In the sample marked No. 1 you will see that the haulm is very much affected with it, but not regularly throughout the several rows; on the contrary, it appears only here and there at present, though in general the whole crop looks unhealthy, the growth being stunted, and the leaves curled or shrivelled. The sample marked No. 2 is a portion of the haulm that has died quite back. I have just dug up the root and find the set (a whole Potato) quite rotten, with eight very small Potatoes attached to it. I dug up another close by, which was dying away in like manner, with the set (half of a Potato) quite sound. If not like the disease noticed at Chiswick, what is it, and what is its probable cause?

JOHN H. HOWARD.

Bath Road, Exeter.

[This is the same disease as that which appeared at Chiswick and elsewhere.—A. M.]

Snowflake Potato.—As your three correspondents, "J. T.," Mr. Hobday, and Mr. Tillery, have evidently given certain treatment to the sets of this Potato after severing them from the tubers, and with different results, the treatment which I have given might, perhaps, be advantageously compared with their's. I cut my 1 lb. of tubers into thirty-three sets or eyes, and planted them directly between my rows of Raspberries; they were hoed up in due course, and have not been attended to since. I have always admired the healthy appearance of the haulm, which is, as yet, quite free from blemish, spot, or curl, and the plants have the appearance of yielding a good crop, as not one of the thirty-three eyes has failed. Now, as this Potato is being extensively patronised, I would suggest that a comparison of results be made at the time of digging, each grower to state, in brief, certain particulars, such as time of planting, number of eyes planted, number grown, appearance during growth, how planted, how long after the eyes were cut out, actual weight from the 1 lb. planted, weight of twelve or twenty of the largest tubers dug, number of Potatoes dug (under 1 or 1½ inches not to be reckoned in the number or weight), when dug, time from planting to digging, with any other remarks that might in the interim suggest themselves.—JOHN H. HOWARD, Bath Road, Exeter.

— I have no reason to complain of Snowflake, as even minutely cut sets of it have done well from my own saved seed; but 1 lb. of

imported seed of Eureka, cut up into fifty sets, has left about two-thirds blanks. It is important to remember that this so-called new disease is chiefly confined to the Rose family; and although symptoms of it show themselves in other American kinds, they only become partially developed. I conclude, therefore, that the Rose section was not worse diseased than other American kinds last year; but that, owing to the soft texture of that section, the tubers became much sooner developed than those of other kinds; and that whilst they could only just muster strength enough to throw up a weak growth, the others could push most of their growths well above ground before decomposition set in.—ALEX. DEAN, *Bedfont*.

American Potatoes.—In addition to those mentioned by Messrs. Hooper (see p. 421), we have also Thorburn's Paragon, Carter's American Breadfruit, American Red, Gleason's Late Callao, Early Callao, and others, the names of which I cannot call to mind, making, probably, in all, some two dozen kinds. As the question "What are American Potatoes?" is of special interest in relation to the forthcoming International Potato Show, it is well to remind readers that, whilst the prizes offered by Messrs. Hooper and Messrs. Carter are for any American kinds—that is, of course, for the handsomest samples—the prizes offered by Messrs. Bliss & Sons are for kinds introduced into this country since the beginning of 1874, so that growers will have to select the three best kinds out of about nine or ten varieties.—ALEX. DEAN, *Bedfont*.

Early Potato Culture in the Channel Islands.—During late years a remunerative industry has made rapid progress in the islands round which Victor Hugo cast the glamour of romance in "The Toilers of the Sea." Owing to the difference of climate, the Potato reaches maturity earlier in the season than those grown in most parts of England, and consequently find a ready market in London, where they successfully compete with the produce of southern Cornwall, the Scilly Islands, and Normandy. Every year the quantity sent to England from Guernsey and Jersey increases, so that the islands promise to become Potato gardens before many years elapse. Almost all the inhabitants who possess a patch of ground cultivate the tuber, which is also largely grown under glass. In these hot-houses the Potatoes are ready for digging at the beginning of spring, when they sell for as much as 2s. or 2s. 6d. a pound to the wholesale dealers in Covent Garden Market. Some idea of the extent already reached by this new industry may be formed from the fact that during two months lately Jersey alone exported 22,623 tons, estimated to be worth £215,000. It is estimated from trustworthy data that the cultivation of this vegetable returns annually nearly £7 10s. for each acre of ground in the island.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Sutton's Matchless Parsley.—This vigorous handsomely curled variety is well worth attention. When seeds of such kinds as this and Carter's Fern-leaved can be obtained so readily, it seems surprising that so much inferior Parsley should be cultivated.—E. HOBDAY, *Ramsey Abbey*.

Dickson's First and Best and Sangster's No. 1 Peas.—We picked on June 14th 20 pecks of these Peas in fine condition. They were sown on January 14th on a border with a west aspect. Owing to the rows running across the border the soil was shaded sufficiently without mulching. Laxton, Alpha, and Kentish Invicta on a south border were ten days earlier but not such good croppers.—J. MILLER, *Clumber*.

Late-sown Parsley.—Where large quantities of Parsley are required at this season, it is a good plan to make a late sowing, say between the middle and end of July. A large proportion of all biennials sown after midsummer fail to flower the following season, and in the case of Parsley it is a decided advantage to have a part of the crop in this condition, as it permits the supply to be kept up without cutting too closely the young spring-sown crop.—E. HOBDAY, *Ramsey Abbey*.

Early Turnips.—Of Snowball, White Strap Leaf, Red American Stone, Early White Stone, and Yellow Altringham, sown early in March, the three first are producing good bulbs, and will be cleared off before the Early White Stone is anything like ready for pulling; it throws up too much foliage. For early Turnips I prefer Snowball and White Strap Leaf; when sown in succession they come in fine and tender all the season, and for late use a good breadth sown in August will keep up a supply during winter.—J. MILLER, *Clumber*.

Endive Running to Seed.—To avoid this at the present early season, the seed should be always sown in a dung frame, grown rapidly, and planted out on the top of a heap of leaf-mould or dung. Even now Endive should be sown in a frame, the seed germinated as quickly as possible, and planted out as soon as ready, on ground made moist with plenty of manure. Endive may be got up easily by simply sowing in heat and pricking out and planting when ready, as is done with early Celery. Thus treated, not 5 per cent. will run to seed.—CHEVALIER.

Beck's Dwarf Green Gem Bean.—This will be found most useful in both large and small gardens, as, unlike all other Broad Beans, it occupies but little room, about 15 inches between the rows being ample space for it, and, as it does not exceed 1 foot in height, it forms an excellent border crop. It is a remarkably free bearer and, when cooked, dark green in colour. A few rows of it on a south border will yield a large amount of produce. It is greatly superior to the Mazagan and the large coarse varieties usually grown for table use.—J. GROOM, *Henham Hall*.

SOCIETIES AND EXHIBITIONS.

THE YORKSHIRE FLOWER GALA.

It has been thought by some that flower shows have done their work, and that their general utilising influences and power to attract attention to the most beautiful products of Nature have worn out; but such would not have been the impression of any who had the good fortune to be present at the annual Yorkshire flower gala, which took place in the ancient cathedral city of York last week. The vast crowds that gathered from all parts of this large county in spite of the bad weather, which was most unusually windy and rainy for the season, afforded sufficient proof that an ever deepening interest in the successful growth of flowers and every other branch of horticulture continues to spread far and wide in all directions. The stream of visitors poured into the city by the various railways, which converge at York, scarcely ceased during the three days of the gala, and it was pleasing to notice that the crowd that passed along the suburb of Holgate to visit the matchless rock-garden in Messrs. Backhouse's nurseries was almost as great as that which made directly for the exhibition field at Bootham. The exhibition itself presented little more than the usual stereotyped selection of "specimen" plants. The Azaleas could not, for a moment, be compared with those of the London shows, but then it is getting late for them. A similar remark, however, applies to the Roses in pots, which ought to be in perfection in the middle of June; they were, however, not to be compared with such as we have seen exhibited by Messrs. Paul, Turner, Lane, and others in the Regent's Park. The show of cut Roses, however, was excellent, with some few exceptions; for instance, there was not a single first-rate bloom of Maréchal Niel or La France. Among the favourite kinds well represented may be named the following:—first and foremost, Madame Lacharme. This is certainly the largest and most perfectly beautiful of all the white Roses. Then there was Madame Villermoz, a fine cream-coloured Rose of somewhat similar form to Maréchal Niel. The next fine bloom calling for notice was one of Triomphe de Rennes, which is of a rich yellow, almost recalling Maréchal Niel both in colour and form. The blooms shown of Marquise de Mortemarte were exceedingly perfect and in good condition, as were also those of Louise Peyronny; Madame Bravy, a Rose of delicate pale yellow; Mdlle. Marguerite Jamain, an attractive Rose, of a bright lively cherry colour, and a novelty. The bedding system, whether right or wrong in principle, still holds firm possession in Yorkshire, if we may judge from the fine collections of zonal Pelargoniums which were exhibited. Looking at the contrasts displayed by many varieties of foliage on this occasion, the following ideas occurred to me as to utilising them in producing broad gardenesque effects. Take the following light-toned zonals, which exhibit modifications of yellow, straw-colour, and light pinky-brown,—say, for instance, Princess of Wales, Impératrice Eugénie, Crown Prince, Queen Victoria, Harrison Weir, and Duke of Edinburgh, and let them be picturesquely planted in close contiguity, the gradation of tone in regard to each other being, of course, carefully studied; then let an adjoining and strongly-contrasting mass be formed of the darker toned zonals, making use of such as Black Douglas, Marshal MacMahon, Bronze Perfection, Prince Arthur, &c. In this manner might be formed a miniature forest, as richly hued as the autumnal tints of American woods when in the full flush of their "Indian summer." These massive and magnificent effects might either be produced in the "landscape" arrangement, commencing close in front of low shrubberies and terminating irregularly against the well-dressed turf of sloping lawn in an irregularly-undulating outline; or this method might be applied in an analogous manner in geometrical arrangements. Some of those fine specimen plants which suggested the idea of obtaining grand effects at once in "bedding out" were trained in pyramidal form, by means of which great variety of effect might be obtained. The handsome silver cup offered by Mr. Bull, of Chelsea, was carried off by a Yorkshire competitor. In fact, with the exception of the fine display of plants sent from London by Mr. Williams, which was greatly admired, the excellent floral exhibition of the gala week, was almost entirely composed of plants furnished by growers from York, Beverley, Darlington, Bedale, and other local nurseries. The prizes offered for collections of alpine and hardy herbaceous plants were well responded to, and some remarkably pretty specimens were exhibited—amongst them was a plant of *Lewisia rediviva* in full bloom, the large crimson flowers of which attracted much attention. Among new varieties of well-known plants was a beautiful Conifer of the *Arbor-vitæ* class, with most strikingly variegated foliage. A large mass of a new *Coleus*, called Lord Wenlock, was shown by Mr. Mitchell, and is certainly one of the most brilliant varieties yet produced. A fine plant was shown of the new Pelargonium Queen Victoria, of which a coloured plate recently appeared in THE GARDEN. Among old favourite garden flowers several attractive new varieties were shown, so very superior in every respect to the old varieties still sent to all our flower markets that one cannot but be surprised at the perseverance with which the old and inferior varieties are still grown in such enormous quantities. I will only mention one instance—that of those popular favourites, the herbaceous Lobelias, three exquisite varieties of which were shown here, and I have not seen better in the metropolitan flower markets or any of the smaller London nurseries; these consisted of a profusely flowered kind of dazzling deep blue called Mazarine Gem; an exceedingly dwarf and compact variety of similar colour, which was as gorgeous as a mass of *Gentiana verna*; and also a large-flowered white variety touched with pure azure, called Miss Edgington. Space does not admit of my mentioning the display of fruit, which was, however, excellent.

York

H. N. H.

ALEXANDRA PALACE ROSE SHOW.

JUNE 24TH.

THIS was, on the whole, a good exhibition, most of the growers, both amateur and professional, being well represented. Mr. W. Paul, Waltham Cross, furnished two stands of seedling Roses, and Mr. T. Laxton, of Stamford, also sent a stand of new seedling varieties. Mr. Paul's flowers were mostly under numbers, but H. P. Firebrand appears to be a good rich crimson variety, likely yet to make its mark as a good and distinct exhibition flower; Peach Blossom and the new Queen of Waltham were also represented by good blooms. Mr. Laxton had a seedling named Dr. Hogg, rather a small but richly-coloured purplish-crimson flower; Mrs. Laxton is a bright scarlet flower, similar in form to Marie Baumann; Emily Laxton is similar in form to Mr. Paul's Peach Blossom, but it is of a deeper rosy colour. Mr. Charles Turner sent two fine new seedling Roses, viz., Mrs. Baker, a smooth-petaled rosy-crimson flower of good substance, the older flowers being tinted with purple; and Oxonian, a distinct and remarkably full flower, the petals being closely imbricated, and of a rosy-crimson colour edged with lilac; it is a first-class flower, and was shown in excellent condition. The chief prizes in the nurserymen's class for seventy-two blooms were well contested, and most of the stands were in really excellent condition, the blooms being fresh and of that good substance which delights the eye of the enthusiastic rosarian. In the 1st prize group of seventy-two blooms, the following, amongst others, viz.:—Charles Bouillard, a fine full rosy-lilac flower; Duke of Connaught, rich velvety-crimson; Madame Thérèse Levet, a globular flower of the most delicate rosy tint imaginable; Madame Berard, a finely-formed Tea Rose in the way of the old favourite Gloire de Dijon; Sophie Coquerelle, a full lilac flower; Centifolia rosea, a fine bloom; John Hopper, Fisher Holmes, the Shah, Madame Lacharme, Emily Laxton and others equally good. In the nurserymen's class for forty-eight blooms, three trusses of each, some good stands were exhibited among which we noted flowers of Impératrice Eugénie, a nearly white variety flushed in the centre with flesh; Baroness Rothschild, in fine form, also Nardy Frères (rosy-purple), Alfred Colomb, and Exposition de Brie (crimson) were all well represented. Trusses of Madame Victor Verdier (rosy-salmon) and La Fontaine (rosy-purple) struck us as being far above the average in this collection, which also included richly-coloured flowers of Maréchal Niel, Charles Lefebvre, Souvenir d'un Ami, Oxonian (new), General Jacqueminot, Madame Berard, and others. In the nurserymen's class for twenty-four H. P. Roses only, three trusses of each variety, we noted some fine blooms, among which were Madame Vidot, La France, Marquise de Montemartre, Madame Lacharme, Madame Jamain, Baroness Rothschild, Centifolia rosea, and other light-coloured varieties; and, among the deep rosy and crimson kinds, the following were particularly effective:—Louis Van Houtte, François Michelin, Duc de Rohan, Dupuy Jamain, Horace Vernet, Fisher Holmes, Beauty of Waltham, Camille Bernardin, and Madame Victor Verdier. Three trusses of a distinct globular-shaped rosy-lilac variety, named Reine Victoria staged in the fourth prize group were unusually fresh and beautiful, and the second prize collection contained fine flowers of La France, Madame Eugène Verdier, François Michelin, Xavier Olibo, Etienne Levet (very fine), Madame Rothschild, and others. In the nurserymen's class 3, for twenty-four Hybrid Perpetual Roses, the first prize was awarded to a very effective stand of excellent blooms, including Néphétos (a delicate white Tea-scented variety, of fine form), Madame Hippolyte Jamain (a full delicate lilac-tinted flower), Charles Lefebvre (a deep velvety crimson), Madame Charles Wood (a fiery crimson), Capitaine Lamure (velvety purple), Etienne Levet, Exposition de Brie, and others equally good. In the nurserymen's class for twelve blooms, we noted some fine illustrations of the following, viz., Charles Lefebvre (a fine crimson flower, tipped with lilac-purple), Madame Hector Jacquin (a fine globe-shaped variety, of a clear satiny rose colour), Duchesse de Caylus (a fine full rosy-crimson flower), La France, Niphétos (a fine creamy yellow Tea-scented variety, very beautiful when seen in the bud), Captain Christy (a fine large rosy-lilac variety, with a deep rosy centre). In the class for eighteen trusses of English-raised varieties, some good flowers of the following kinds were staged, viz., Miss Ingram, a fine globular white flower suffused with pale rosy-lilac; John Hopper, a fine lilac-purple, with a crimson centre; Duke of Edinburgh, fiery crimson, with a rich velvety texture; John Stuart Mill, like Marie Baumann, but a shade lighter; Miss Hassard, rosy flesh, round, and full.

Tea Roses were rather poorly represented in amateurs' collections, but in some of the nurserymen's stands were finely-formed flowers of the following, viz., Mons. Furtado, a delicate sulphur, climbing Devoniensis, Cheshunt Hybrid, a fine lilac-purple kind, very delicately perfumed; President, a smooth petaled flower of a delicate rosy-salmon colour; Adam, soft rose; Souvenir d'un Ami, rose; and Maréchal Niel, bright yellow. Some of the flowers shown in this class were deeper in colour than in the single stands. Catherine Mermet, a fine rosy-salmon, Pauline Labronté, a bright satin-like rose, with a bright salmon centre; Solfaterre, a delicate sulphur-tinted Noisette; Rubens, a wax-like creamy-white flower; Perle de Lyon, a fine golden-tinted variety, with a deep salmon centre; Madame Capucine, a bright rosy-salmon, very distinct; Gloire de Bordeaux, a fine full rosy-lilac flower; and Belle Lyonnaise and Madame Villermoz, both good. Eight stands of Tea Roses were staged by amateur growers, and six by nurserymen, those of the last-named being by far the best in point of quality.

In the amateurs' class, for forty-eight cut blooms, some fine and remarkably even stands were contributed. Among blooms in the first prize stand were excellent examples of John Hopper, Madame Rady, Alfred

Colomb, Louis Van Houtte, a rich velvety Rose, of a purplish-crimson colour; Baron Adolphe de Rothschild, a fiery-scarlet, the edges of the petals curiously crisped; Victor Verdier, and Centifolia rosea, a fine bloom; Beauty of Waltham, Edouard Morren, a full and bright rosy-salmon flower; Madame Eugène Verdier, Duchesse de Caylus, and others. In the second group were good flowers of Céline Forestier, Marquise de Castellane, Madame Rivers (a well-known old favourite), Madame Margottin (yellow Tea), John Hopper, Caroline de Sansal, and other well-known kinds. In the amateur class for thirty-six cut blooms, the stands were in many cases very poor. Three of the exhibitors, however, contributed very effective and well-arranged stands. In the first prize groups, we noted good blooms of Pierre Notting, a full purplish variety; Marie Rady; Etienne Levet; Madame Victor Verdier, Ferdinand de Lesseps, a bright rosy-crimson variety, very full; Centifolia rosea, and others. In the amateurs' class for twenty-four cut Roses, seventeen stands were staged, some of them containing blooms of very fine quality. Among the best were Madlle. Marie Rady, a fine full flower of the Marie Baumann type, but of a more decided purplish-crimson colour; Centifolia rosea, a fine rosy-lilac, one of the oldest, and still one of the best; Xavier Olibo, a deep velvety-crimson; La France; Duchesse de Caylus, a fine full crimson flower, similar in form to Madame Baumann, but brighter; General Jacqueminot, brilliant crimson-scarlet; Dupuy Jamain, a fine smooth-petaled variety of a bright purplish-crimson colour; Etienne Levet, a full rosy-lilac; Souvenir de la Malmaison (Tea), bluish; Paul Verdier, rich crimson; Annie Laxton, a high-coloured satiny variety of a distinct rosy-colour; Madame Norman, white, with flesh-coloured centre; Abel Grand, a fine full rosy-lilac flower; Dr. Andry, rich velvety-crimson; Comte de Paris, a full rosy-crimson variety, with stout waxy foliage; the Shah, a small bright velvety-scarlet rose; Madame Alice, Dureau is a fine full flower, the colour being a delicate satin-like rose, and Lady Suffield is a good flower of the Marie Baumann type. Some very fine single stands (twelve trusses) of flowers were staged of Duke of Edinburgh, a fine new crimson-tinted Rose of good form, with smooth velvety petals, and in every respect a first-class dark kind. Some very fair stands of Maréchal Niel were staged, but in most cases the blooms lacked freshness, and in more than one case they were deficient in colour; Marie Baumann, a fine, full, crimson-lilac-tinted variety, was shown in good condition by half a dozen different growers, some of the stands containing blooms remarkably fresh and of good substance. This is, in every respect, a first-class Rose, being fine in form and rich in colour; some of the freshest of its flowers had a brilliant fiery glow, while the older blooms were delicately tinted with lilac. La France, the best light Rose of its class was represented in some half a dozen good stands. The new white Hybrid Perpetual Rose Madame Lacharme was well shown by four exhibitors. Its flowers are nearly perfect in shape, and white in colour, with just a flush of flesh or rosy-salmon in the centre. Two good stands of Princess Beatrice were staged, but some of the flowers wanted freshness. The soft rosy Baronne de Rothschild was represented in two or three good stands, some of the flowers being 6 inches across, and of good form and substance. There were two or three very fine stands of Edouard Morren, now a well-known exhibition variety, globular in form, and rosy-lilac in colour, with a rosy-crimson centre. Alfred Colomb was represented in four excellent stands. This is a finely-formed and well-known exhibition Rose, of a fiery-crimson colour, round and full. Several subjects of a miscellaneous description were contributed, but for the names of those who showed them, as well as for those of successful competitors in the different classes of Roses, we must refer to the prize list (see p. xvii. of Advertisements).

Pansy Propagation.—Allow us to inform "Enquirer" (see p. 492) that cuttings of bedding Pansies and Violas are better than seedlings, inasmuch as the latter do not come true to colour. Cuttings ought to be put in in a shady border or cold frame in September. The following may be depended on for early spring flowering, viz.:—Yellows: Viola Golden Gem and Griewel, and Pansy Golden Bedder; blue: Pansy Blue King; plum-purple: Viola Alpha and The Tory; white: Viola White Perfection, Dickson's White Bedder, and Dean's White Swan.—Dicksons & Co., 1, Waterloo Place, Edinburgh.

—Cuttings are better than seeds. For very early spring blooming, they should be put in now. They root freely in a somewhat sandy soil, under a shaded frame or hand-glass. A quicker way of propagating them is to divide the old plants so as to leave a small root to each shoot, and to lay them in the ground in some shaded corner. Dickson's Blue Bonnet and Blue King, White Queen, Regina, Golden Bedder, and Sunbeam, are all excellent kinds for bedding. Many of the Violas are quite as beautiful and useful as Pansies; and among the best I have tried are the following:—Blues, Eyebright and mutilata; yellow, Golden Gem and Canary; whites, White Bedder and Snowflake. Violas may be increased in the same way as Pansies. For summer and autumn blooming, the cuttings need not be put in until the beginning of October.—J. Muir.

OBITUARY.

WE have to record, with much regret, the death of Mr. William Rollisson, the head of the well-known nursery firm of that name at Tooting, on Friday, the 18th inst., in the seventy-third year of his age. Independently of his professional reputation, which was deservedly high, Mr. Rollisson's geniality of disposition and straightforwardness of character endeared him to a host of private friends, who will not soon forget his loss.

